NATIONAL SEMINAR

ON

PREVENTION OF ACUTE RESPIRATORY INFECTIONS IN CHILDREN IN ICDS PROJECTS

A REPORT

(29-30 August, 1989)

National Institute of Public Cooperation and Child Development
5, Siri Institutional Area, Hauz Khas, New Delhi-110016

05786

Community Health Cell
Library and Documentation Unit
367, "Srinivasa Nilaya"
Jakkasandra 1st Main,
1st Block, Koramangala,
BANGALORE-560 034.
Phone : 5531518

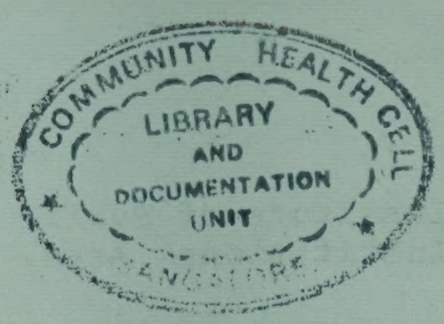
National Seminar on Prevention of Acute Respiratory Infections in Children in ICDS Projects

A Report

(29-30 August, 1989)

National Institute of Public Cooperation and Child Development
5, Siri Institutional Area, Hauz Khas, New Delhi 110016

CH135 N89
05783



Programme Director: Dr. Dinesh Paul
Deputy Director(Health)
NIPCCD

Programme Associate: Dr. Neelam Bhatia
Research Assistant(Health)
NIPCCD

CONTENTS

		Page No.
SECTION I	INTRODUCTION	1-5
SECTION II	OBSERVATIONS & RECOMMENDATIONS	6-11
SECTION III	REVIEW PAPERS	
	The Role of Immunisation in the control of ARI in Children - T. Jacob John	12-15
	Management of ARI in Children - O.P. Ghai	16-21
	Epidemiological Perspective on ARI in under fives - V.P. Reddiah	22-25
	Problems of ARI in India - K.K. Datta	26-36
SECTION IV	RESEARCH PAPERS	
	Prevention of ARI in Children in ICDS Projects - T. Rajagopal	37-40
	Pilot Study of Control of ARI at Primary Care Level - N. Shantharam	41-45
	Extent of Problem of ARI in Rural Area in ICDS Block and Preparing Manpower to Fight ARI - Sunder Lal	46-60

Some Epidemiological Features of ARI in West Bengal 61-65

- A.K. Chakraborty

Rational Drug Therapy in ARI in Children 66-72

- Lata Kumar

A Study of Morbidity and Mortality amongst Pre-school Children in 12 AWs of Surat Project 73-83

- D.M. Saxena

Utilisation of AWWs in Surveillance of ARI 84-96

- P.L. Joshi

SECTION V Acute Respiratory Infections

- Dinesh Paul 97-106

- Umesh Kapil

ANNEXURE

I. Participants and Resource Persons i-vii

II. Programme Schedule viii-xi

III. Kit Material xii

IV Bibliography on ARI xiii-Liii

SECTION I

INTRODUCTION

INTRODUCTION

India is one of the signatories to Alma Ata Declaration on 'Health for All' by the year 2000 through primary health care. Under this commitment, the Government envisages to reduce IMR from the existing 95 to 60 per 1000 live births and pre-school mortality from 30 to 10 per 1000 children.

Acute Respiratory Infections (ARI) are quite common in children in India and constitute a serious public health problem. The infections are the single most important contributor to high morbidity and mortality in children under five years of age. Data from CBHI, Registrar General of India, as well as community based longitudinal studies show that 15-34 per cent of all childhood deaths are attributable to ARI.

No reliable statewise ARI morbidity and mortality data are available in the country. However, a study conducted in rural areas of Ballabgarh Block, Haryana (1988) reported that the morbidity due to ARI was 3.67 attacks/child/year. Proportional mortality rate due to ARI was 22.6 per cent in the under-five children; 66.5 per cent of deaths were in infants. The case fatality rate was 1.31 per cent and ARI related mortality was 6.3/1000 children.

A longitudinal study conducted in a semi-urban area of Pondicherry (1986) showed that Upper Respiratory Infections and Lower Respiratory Infections accounted for 42 per cent and 9.3 per cent morbidity in the under-five children respectively.

Community based studies conducted by PGI, Chandigarh reported that ARI accounted for 3.47 attacks per child per year in the under-three children. The attack rate was 2.2 per cent during the first year of life. In a survey carried out in children below five years (1984) and in another (1985) the point prevalance of Acute Lower Respiratory Infections was

found to be 2.4 per cent and 7.2 per cent respectively. Several cohort studies and those based on routine reporting of births and deaths carried out by Post Graduate Institute of Medical Education and Research have indicated that ARI associated mortality is responsible for 20.5-25.0 per cent of all deaths in pre-school children.

Severe respiratory infections, especially pneumonia, contribute to 20-25 per cent of all deaths in children, with an estimated 600,000 deaths per year in India. Besides high mortality, ARI leads to significant disability in the form of chronic respiratory disease, deafness, malnutrition and cardiac disease. The burden of ARI related illnesses is a considerable strain on the health facilities of the country.

In spite of the magnitude and serious nature of the ARI problem, there is no programme for its control, although some that are preventable with immunization are part of the EPI. The available scientific knowledge for its control - standard case management, health education and preventive measures including immunization, breast-feeding, proper nutrition and environmental control - can lead to a significant reduction in morbidity and mortality among children.

The Integrated Child Development Services programme has shown a considerable response from the community. Studies show that there is a reduction in IMR. The birth rate in ICDS project areas is low as compared to those not covered by ICDS. The immunization coverage is higher in ICDS project areas. There is an urgent need to initiate steps for ARI control within the existing health and ICDS infrastructure, which is possible as evident from the achievements in ICDS project areas.

In view of this the Institute organised a two-day National Seminar on "Prevention of Acute Respiratory Infections in Children in ICDS Projects" from 29 to 30 August 1989 at its premises in New Delhi.

Objectives

The objectives of the seminar were:

i) to review recent trends in the incidence of Acute Respiratory Infections;

ii) to provide a forum for a national debate on the seriousness of ARI in contributing to childhood mortality; and

iii) to suggest appropriate strategies for its control in the context of the country's existing health care infrastructure and ICDS infrastructure.

Participants

About 50 participants comprising senior officials from the Ministries concerned, paediatricians, community medicine specialists, epidemiologists, microbiologists, ICDS consultants and representatives of voluntary and international agencies participated in the seminar. A list of participants is at Annexure I.

Inaugural Session

The seminar was inaugurated by Dr B N Tandon, Professor and Head, Department of Gastroenterology, A.I.I.M.S. Shri D.P. Sethi, Director, NIPCCD welcomed the chief guest and the participants of the seminar. Dr Dinesh Paul, Deputy Director (Health) gave outline of the theme of the seminar.

Dr B N Tandon in his inaugural address said that the application of management studies in disseminating, implementing and analysing health problems including the prevention of Acute Respiratory Infections (ARI) is a prerequisite for improvement of health conditions in the country. The concept of management has been neglected resulting in a weak infrastructure and network of health facilities in our entire system of public health.

Stressing the implementation of precautionary measures in health for children at the grass-root; level, Dr Tandon said that the Anganwadi Workers should be imparted specific training so that they become an integral part of the medical system. This can only be done those who manage Public Health and Integrated Child Development Services (ICDS) work together in implementing the schemes. The personnel of concerned departments should develop an understanding that their services are aimed at achieving a common mission, he said.

Dr Tandon emphasized the need for creating scientific culture in the country, which should help in improving the health of children. The interaction of scientists at various scientific platforms should focus on the causes of Acute Respiratory Infections in children and consider whether it is possible to make more effective drugs to control the infection. We have become more programme oriented rather than child oriented", Dr Tandon observed.

Plenary Sessions

The participants met in five plenary sessions and discussed the following thematic papers commissioned from various experts:

i) Epidemiology of ARI in Children
ii) Strategies for Reduction of ARI in ICDS
iii) Problem of ARI in India
iv) Management of ARI
v) Vaccines in the Control of ARI.

In each session a discussion paper was presented by an expert, followed by discussions among the participants. (The Review Papers are included in Section III of the Report).

In addition, eight scientific papers on studies on Epidemiology and control of ARI were also presented in the seminar (The Research Papers are included in Section IV of the report).

The seminar invited contributions from the participants in the form of write-up/paper/article on any aspect of ARI, which could serve as background material for the seminar. While all such contributions were circulated, a background paper specially prepared by the faculty of the Institute for the seminar has been given in Section V of the report. In addition, published articles/papers/bibliography on ARI etc. were circulated as background material among the participants. These are listed at Annexure III and IV.

The list of participants including resource persons and Programme Schedule of the seminar are at Annexure I and II respectively.

Concluding Session

The concluding session of the seminar was chaired by Dr. A.K. Chakraborty, Professor, Department of Epidemiology, All India Institute of Hygiene and Public Health. Dr. Dinesh Paul, Seminar Director presented a brief report on the seminar containing the main observations and recommendations which emerged from the deliberations of the seminar.

The following pages contain the main observations and recommendations of the seminar, the review papers, research papers and background paper.

SECTION II

OBSERVATIONS AND RECOMMENDATIONS

OBSERVATIONS AND RECOMMENDATIONS

The participants were divided into two sub groups and they were entrusted with the responsibility of making specific recommendations in relation to (i) primary, secondary and tertiary prevention of ARI in children through ICDS; and (ii) role of other sectors in controlling ARI. The following observations and recommendations emerged from the seminar:

I. Primary Prevention of ARI

2. The consensus among the participants was that primary prevention of ARI should be dealt under two broad areas:

i. Health Promotion
ii. Specific Protection

Health Promotion

3. Besides routine activities under the health promotion, the most pregnant proposition the group put forward was that a KAP study in a sample of ICDS blocks should be conducted on a common protocol with a time-bound frame which shall help in

(a) generating information for developing IEC activities for the beneficiaries as well as providers;

(b) forming basis of training of peripheral workers.

4. The group also emphasised that the existing nutritional services, including breast-feeding and Vitamin A supplementation through ICDS, should be strengthened both qualitatively as well as quantitatively, and the accessibility to these services should be increased.

5. Environmental factors specially should be regarded as a major facilitating cause for transmission of respiratory infections and steps towards improving the environment should form an important preventive measure. Use of smokeless chulahas and biogas should be encouraged.

6. As inter-sectoral approach to the problem, messages related to information and education about the prevention of ARI should be included in the school education right from the primary school education stage, and for this NCERT may be approached to develop simple and effective curriculum to be incorporated in school education with the help of experts from the field of health sciences.

Specific Protection

7. The major activity that was identified under specific protection by the group was basically related to immunization, and it was felt that the immunization activities as such should be boosted.

8. The major thrust in immunization should be on research, especially looking into:

(a) Feasibility of 2 doses of measles vaccine (the first at the age of 6 months and the second between 12-15 months).

(b) Research for developing effective and cheaper vaccine related to respiratory infections in children. For this certain apex institutes in the country should be identified and entrusted with the responsibility.

9. Besides, the group felt that instead of the present 85 per cent coverage strategy, every child should be immunized with a safe, effective and potent vaccine.

II. Role of Other Sectors

10. Though the principal responsibility of preventing the childhood infections is that of the health sector, it was agreed unanimously that other sectors be approached to develop and implement the strategies for Primary Prevention of ARI.

The group identified the following sectors:

(a) Local Self Government and its various sectors
(b) Education sector
(c) Health infrastructure related to ISM
(d) Media

11. Government bodies together with Non-Governmental organizations like WHO, UNICEF etc. and various voluntary agencies should be involved specially in the areas of

(a) community awareness
(b) social mobilization
(c) training of manpower
(d) developing IEC activities, and wherever possible supporting the delivery system in form of
- delivery of services
- manpower and monetary support
- developing and executing surveillance support
- timely referral

12. The group felt that the existing (though unorganized) RMPs should be contacted and efforts be made to involve them, without hurting, in the dissemination of health information and surveillance; also the possibility of their reorientation towards use of drugs in ARI may be explored.

13. The group observed that these were some of the areas where its recommendations could be considered in the light of the magnitude of the problem it was addressing to; technicalities in detail could be worked out for effective ARI Control Programme that was in the offing.

III. Secondary and Tertiary Prevention of A.R.I

14. The group considered the following in the context of ICDS and felt it should be an integral part of MCH services under Primary Health Care.

- Early Detection
- Prompt Treatment
- Timely Referral
- Disability Limitation and Rehabilitation

Early Detection and Prompt Treatment

15. For Early Detection, the group felt, it is essential to impart Orientation Training and Continuing Education to MOs, Supervisors, Health Workers and AWWs on the existing pattern of ICDS. Team training should be emphasised, Continuing Education as being attempted through sectoral meeting and Health Centre meetings should continue.

16. WHO Modules/Standard Module should be used for training. This should incorporate the following suggestions:

ARI should be divided into two categories;

CATEGORY 'A' - MILD consists of cough + cold with or without fever and normal breathing.

CATEGORY 'B' - Fast breathing and flaring of Alae Nasi, Acute Carpain, Wheeze, Subcostal and Inter Costal recession (Chest indrawing), cyanosis, inability to drink, excessive crying, convulsion and altered sensorium.

CATEGORY 'A' - Should be managed at home with supportive treatment (Paracetamol, Feeding, Oral fluid) and watch or close monitoring for fast breathing by mother and AWW/ANM.

No antibiotics are required.

CATEGORY 'B' - Coughs having only Rapid breathing without any severe signs of Respiratory Distress (chest indrawing, cyanosis, altered sensorium, convulsions) should be treated with antibiotics. ANMs/AWWs should be provided with antibiotics. Choice of antibiotics is co-trimoxazole. Its effect should be evaluated periodically. Children having severe signs of Respiratory Distress should be referred immediately.

17. The considered opinion of the group was that certain high risk cases like neonates and children below 6 months of age, grade III and IV malnutrition, measles and pertussis with respirat distress as if the mother is very anxious or persists should be referred.

IV. Monitoring and Supervision

18. Training and Management should be built into the programme.

19. Surveillance of at least ARI Mortality should be recorded at the level of anganwadi and sub-centre for evaluation and effectiveness of interventions. Adequate treatment facilities and referrals should be developed at various levels like PHC and CHC onwards by strengthening these units with material and manpower.

20. Education of Parents and Communities on ARI prevention and management should become an integral part of the routine activities of the Health and ICDS team.

21. Comprehensive Research Studies on ARI should be conducted to have more information for effective and better management.

SECTION III
REVIEW PAPERS

The Role of Immunization in the Control of Acute Respiratory Infection in Children

- T. Jacob John*

Introduction

Acute respiratory illness (ARI) as a group contributes to about a quarter of all deaths in the under-fives in the developing countries such as India. As has happened in the developed countries, with socio-economic development, the resultant improvement in nutrition, immunization, less crowding in the home and better body hygeine, the contributions of ARI to the under-five mortalities and under-five mortality itself will decline. However, without waiting for that degree of socio-economic development to obtain these side-benefits, we ought to reduce ARI mortality in the under-fives now. Appropriate tactics for this may include prevention by immunization; reduction of severity by vitamin A supplementation and early diagnosis and treatment.

In this paper, I will examine the role of immunization in the reduction of both morbidity and mortality due to ARI.

Aetiology of ARI

ARI is caused by viruses and bacteria. The common viruses include respiratory syncytial virus (RSV), parainfluenza virus, influenza viruses, adenoviruses, coronaviruses and rhinoviruses. The mortality of purely virus-cause ARI, both upper respiratory illness (URI) and lower respiratory illness (LRI), is very low.

The common bacteria causing ARI, particularly LRI, with attendant high mortality, include *Streptococcus pneumoniae* (pneumococcus), *Haemophilus influenzae* and *Staphylococcus aureus*. Diphtheria is rare, but its mortality is high. Tuberculosis causes chronic respiratory illnesses.

---

* Prof. & Head, Department of Virology and Immunology, CMC, Vellore.

In addition to the specific aetiological agents of ARI, there are predisposing factors which contribute to the severity of LRI and thereby increase the mortality. Vitamin A deficiency is believed to be one such predisposing factor. Recent measles and pertussis also appear to be other predisposing factors. It is generally believed that in unimmunized children about 10 per cent of deaths due to LRI is caused by or predisposed by pertussis and about 15 per cent predisposed by measles.

The Role of Routine Immunization

By routine immunization I mean the currently used vaccines under the national immunization programme, namely, those against tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles.

Three components in the routine immunization has an impact on ARI morbidity and mortality. They are diphtheria, pertussis and measles vaccines.

The vaccine efficacy of diphtheria toxoid is near 100 per cent. Therefore, diphtheria can be totally prevented by immunization.

The vaccine efficacy of pertussis vaccine is about 75 per cent. However, even in the unprotected 25 per cent, the illness is less severe and we presume that pertussis-related mortality can be totally prevented by pertussis immunization. The diphtheria-pertussis-tetanus (DPT) vaccine is recommended to be given in 3 doses, starting at 6 weeks of age or as soon thereafter as possible and with a minimum of 4 weeks interval between doses. This will result in the reduction of ARI mortality by 10 per cent.

The vaccine efficacy of measles vaccine is over 95 per cent. It is recommended at 9 months of age or as soon thereafter as possible. During outbreaks, measles vaccine may be offered to infants over 6 months of age. However, any infant given measles

vaccine below 9 months should be given a second dose at or after 12 months. Measles immunization will result in the prevention of acute LRI predisposed by measles. This will result in the reduction in ARI mortality by at least 15 per cent.

The Role of Newer Vaccines

Vaccines are available against pneumococci and H. influenzae (type b). Both vaccines have been prepared from the capsular polysaccharide.

Although over 80 types of pneumococci have been identified, the majority of infections in adults and in children (in the developed countries) are caused by a limited number of types. For example, in childhood infections, serotypes 1,3,4,6,7,9,14, 18,19 and 23 have been found to predominate. The currently manufactured vaccine contains the polysaccharide antigens of 23 types.

Haemophilus influenzae (type b) is the major pathogen, although other types and hitherto untyped ones also seem to be involved in childhood infections. The available vaccine is against H. influenzae type b (Hib).

Polysaccharide antigens are T-independent. Therefore, infants tend to respond poorly to them and immunologic memory is poor. For these reasons, pneumococcal and Hib vaccines have not become usable tools as yet in the prevention of morbidity and mortality in the first two years of life, when the need is the greatest.

Polysaccharide antigens may be conjugated with protein antigens such as tetanus or diphtheria toxoids, rendering them more immunogenic, particularly in the very young.

At present, the epidemiology of pneumococcal infections, particularly the prevalence of specific types in geographic areas as well as in childhood infections in the developing countries, is not well-defined. This factor along with the ones stated above as well as the high cost of the vaccines have been the deterrants in the widespread use of these vaccines in the developing, or even in the developed countries.

In India we urgently need studies into the epidemiology of pneumococcal and H.influenzae diseases in the under-fives in order to be prepared to absorb these and other newer vaccines into our national immunization programme.

Vaccines of the future

The large majority of ARI in the under-fives is caused by viruses, the commonest being respiratory syncytial virus and parainfluenza viruses. Several research centres in the developed nations are engaged in developing vaccines against these virus infections. Success in these endeavours are not yet in sight.

Recommended reading

1. Bacterial Vaccines Ed. Germanier R, 1984, Academic Press, New York.

2. Towards Better Carbohydrate Vaccines Ed. Bell R and Torrigiari G 1987, John Wiley & Sons, New York.

3. Acute Respiratory Infections in Childhood Ed Douglas RM and Kerby-Eaton E, 1985, University of Adelaide, Adelaide.

4. Giebink GS. Preventing pneumocoical disease in children: recommendations for using pneumocoical Vaccine: pediatr, infec Dis 1985, 4: 343-348.

5. Cochi SL and Broome CV Vaccine prevention of Hemophilus influenza.

Management of ARI in Children

- O.P. Ghai*
- M.V. Murali**

Extent of the Problem

It is estimated that about 15 to 34 per cent of all childhood deaths are attributable to ARI. Surveys conducted in various parts of India indicate that a child on an average suffers from 2 to 6 episodes of ARI every year. About 10-15 per cent of these illnesses progress to moderate or severe intensity with case fatality rate of 5-10 per cent.

Caustative Agents

Bacterial	:	Streptococcus pneumoniae, staphylococcus aureus and hemophilis influenzae
Viral	:	Respiratory syncytial virus, adenovi influenzae, parainfluenza, Rhinovirus Measles
Chlamydial	:	TRIC Agent

A great majority (upto 70%) of severe life threatening respiratory infections or pneumonias are caused by bacterial agents which are amenable to antimicrobial therapy.

Sites Infected

Infection can extend from nose, nasopharynx, middle ear and throat to lower respiratory tract. However, a majority of serious illnesses are due to infections involving lower respiratory tract.

---

* Professor and Head, Department of Pediatrics, University College of Medical Sciences and Guru Tegh Bahadur Hospital Delhi-110 095

** Lecturer, Department of Pediatrics, University College of Medical Sciences and Guru Tegh Bahadur Hospital, Delhi -11 095

Principles of Management

The significant progress made in the management of ARI in children can be consolidated into simple case treatment schedules. The basic aim of therapy is to prevent death due to ARI. The principles of therapy are:

(a) Treatment of an acute episode
(b) Recognition of life threatening conditions
(c) Prevention of complications/sequalae

Treatment of an Acute Episode

It essentially consists of the following steps

(a) Assessment of clinical severity
(b) Antimicrobial therapy - indications, choice, duration and dosage
(c) Supportive treatment
(d) Referral support

(a) Assessment of Clinical Severity

Three cardinal signs viz chest indrawing, inability to drink and rapid breathing are used to assess the severity of ARI in a child with cough

(a) Severe - Presence of either chest indrawing or inability to drink indicates severe infection. Irrespective of respiratory rate, these children require antimicrobial treatment plus referral to a hospital for admission.

(b) Moderate- Respiratory rate of over 50 per minute (in the absence of chest indrawing and inability to drink) indicates moderate disease, which requires antimicrobial treatment but can be treated at home.

(c) Mild - Absence of above three signs, point to a mild disease. These children require close observation and supportive treatment at home.

The ability of health workers to discriminate severity of ARI into the above three groups is crucial to the success of management of ARI in children.

(b) Antimicrobial Therapy

Mortality due to ARI is reduced significantly by the use of antimicrobials. However, their usage must be rational in order to preserve their effectiveness and reduce cost in case management.

(1) Indications of antimicrobial therapy

All children with moderate and severe form of ARI warrant antimicrobial therapy. On the other hand, supportive therapy is adequate for mild ARI.

(2) Choice and dose

(1) Cotrimoxazole (4 mg of trimethoprim per kg and 20 mg of sulfamethaxazole per kg every 12 hrs)

1 cotrimoxazole contains 80 mg trimethoprim and 400 mg sulphamethaxazole.

Dose

Infant (3-9 kg) 1/4 tablet twice a day
Toddler (10-19 kg) 1/2 tablet twice a day
School Age (20 kg or more) 1 tablet twice a day

(2) Amoxycillin (15 mg/kg/dose three times a day)

Dose (for 250 mg tablet)

Infant (3-9 kg) 1/4 tablet thrice a day
Toddler (10-19 kg) 1/2 tablet thrice a day
School age (20 kg or more) 1 tablet thrice a day

(3) Ampicillin (25 mg/kg/dose four times a day)

Dose(for 250 mg tablets)

Infant (3-9 kg) 1|2 tablet four times a day
Toddler (10-19 kg) 1 tablet four times a day
School - age (20 kg or more) 2 tablets four times a day

(3) Duration

All these antimicrobials are given for five days.

(c) Supportive therapy

(1) Fever - Paracetamol (acetaminophen) is the safest drug to reduce fever. The dose is 10 mg/kg/dose. Paracetamol is given three times a day for two days:

Infant (3-9 kg) - ½ tap paracetamol (1 tap--125 mg)
Toddler (10-19 kg) -¼ tablet (1 tablet-500 mg)
School age (20 kg or more) -½ tablet

(2) Cough- Various cough mixtures may make a child more comfortable but it does not make the child recover faster.

(3) Nasal block - Nasal block may be troublesome in small infants and can interfere with feeding. It is relieved by 0.25 per cent ephedrine saline nasal drops.

(4) Feeding

(1) A child who is breast-feeding should continue to do so.

(2) Despite anorexia, children with ARI must be encouraged to eat. Eating prevents the child from becoming malnourished.

(3) Hydration of the child must be maintained by giving plenty of fluids.

(5) Monitoring

A child on home care must be monitored regarding how the child breathes. If the child breathes fast, the family should bring him to the health worker immediately.

(d) Referral support

Children with severe ARI must be referred immediately because they cannot be adequately managed at home. Some children with moderate illness may require referral if they fail to respond to antimicrobials. Referral units should have available second line antibiotics and equipment for oxygen administration.

Prompt referral support improves efficacy of community health worker and his or her acceptability in the community.

RECOGNITION OF LIFE THREATENING CONDITIONS

The danger signs in a patient with ARI:

(a) Cyanosis - bluish discolouration of tongue, lips and nails due to hypoxia

(b) Convulsions or altered sensorium - either due to high fever, hypoxia or intracranial infection

(c) Apnoea - cessation of breathing
These children require intensive therapy in a hospital.

Prevention of Complications/Secualae

(a) Rheumatic fever

Primary Prevention - consists of identifying patients with streptococcal sore throat and instituting antimicrobial therapy.

Secondary Prevention - All patients with rheumatic fever are treated with intramuscular injection of benzathine penicilin at intervals of three weeks. This prevents a subsequent streptococca infection and therefore recurrence of rheumatic fever.

(b) Acute glomerulonephritis

Prompt treatment of streptococcal sore throat may prevent development of acute nephritis. Unlike rheumatic fever, however, patients with acute nephritis do not need long term prophylaxis.

(c) Otitis media

Infants are more susceptible to acute middle ear infection because their eustachian tube is relatively short and infections can travel easily from nasopharynx to middle ear. Tubes are easily blocked due to allergic rhinutis, adenoidal enlargement and infections, causing stasis of secretion which are not easily drained off through the tubes. Prompt decongestion of nose and eustachian tube by 0.25 per cent ephedrine in saline nasal drops and use of antimicrobials prevent these complications. Some physicians prefer to use systemic decongestants such as pseudoephederine in place of nose drops.

Prevention of ARI

(a) Specific : Immunisation with DPT, BCG and Measles vaccination because illnesses prevented by these vaccines contribute heavily to childhood morbidity and mortality by ARI.

(b) Non-specific

1. Promotion of breast-feeding
2. Proper nutrition
3. Reduction of parental smoking
4. Decreasing indoor air pollution

Epidemiological Perspective on A.R.I. in Underfives

- V.P. Reddaiah*

It is estimated that 15.2 million under-fives die every year in the world (10.7 million infants and 4.5 million 1-4 year olds) out of this 14 million die in the developing world. Acute respiratory Infections account for 20-25 per cent of these deaths (4 million). ARI is the first or second cause of death in these areas. Twenty-five per cent of these ARI deaths are due to vaccine preventable diseases, specially Pertusis and Measles. Pneumonias are responsible for 70 per cent of the ARI deaths and mainly perceived due to bacterial infection. Studies have shown that each child suffers 4-8 attacks per year.

Realising the importance of ARI, W.H.O. started a programme for control of Acute Respiratory Infections in 1982. The objective of this programme was to reduce morbidity, severity and mortality due to ARI with major emphasis on prevention of mortality due to pneumonia. W.H.O. strategy consists of

1. Immunization with special emphasis on D.P.T. and Measles.
2. Case management
3. Health Education.

Using this strategy, many studies have shown that the under-five mortality can be reduced. By 1988, 17 countries spread all over the world have started ARI Control Programme using WHO strategy.

We have done a study using this strategy and found it quite useful. Now the question arises whether a national programme can be started in I.C.D.S. projects.

---

* Additional Professor, Centre for Community Medicine, AIIMS, New Delhi.

Before any large-scale implementation is carried out, one needs to know the Epidemiology of ARIs and the effectiveness of the WHO strategy in reducing the under-five mortality. Now, I will present the situation in this country and our experience.

It is estimated that 0.6 to 1.0 million under-fives die every year due to ARI in our country.

First, I will present the data from our Ballabgarh C.R.H.S. Project area to highlight the under-five mortality and mortality due to ARI.

Roughly about 45 per cent of the total deaths in the Community were in the under-fives. ARI is the second commonest cause of death in infants (17.5% in Neonates and 23.4% in Post neonates) and the first in the 1-4-year-olds (24.4%).

Now I will present the data from our rural Hospital. A quarter of the under-five admissions to the hospital were due to ARI and 70 per cent of these were males. Though the admission of males was higher, the case fatality was 50 per cent more in females. (11.9 in males Vs. 15.0% in females), 60 per cent of the admitted were infants. Case fatality rates were marginally higher in 1-4-year-olds. (13.7% Vs. 12.3% in infants).

Regarding the pattern of ARI in these admissions, 67 per cen were due to pneumonia, about 15 per cent were due to Measles or Post-measles Broncho pneumonias. The case fatality rates in the latter were 2½ times higher (31.8%).

The pattern of cases attending the casuality at this Hospital shows a quarter of infants attending were due to ARI but 16.0 per cent in 1-4-year-olds.

The data based on the study done in the community has shown that each under-five suffers 3.67 attacks per year. Of these 14.7 per cent were moderate and severe case mostly pneumonias). But the case fatality in the latter category was only 1.31 per cent and ARI related under-five mortality was 6.3/1000 under-fives.

To provide further information on the epidemiological characteristics of Penumonias, I will present the salient features. The Pneumonia attack rate was 39/100 children per year with more cases reported in males. It was three times more common in infants, 99.5 per cent were moderate cases. Severity was very high in neonates, almost ten times more than in others. About 50 per cent attacks were in infants and about 90 percent in under 3 years. The highest attack rate was observed in winter and the lowest in summer. The mean duration observed was 5½ days, about half suffering more than 5 days.

The first contact person for these episodes was the ARI worker (50%) and next most important was R.M.P. (36%) and the local M.P.Ws. were contacted in 7 per cent and Hospitals 6.0 per cent.

Very few cases shown to R.M.Ps. were referred. Referrals going were utilized in about 60 per cent of cases and about 50 percent to hospitals were admitted.

Case fatality was ten times more in neonates. It was 50 per cent more in females. Case fatality was very high in severe cases. It was higher in seasons where climate changed, i.e. September-November and March-May. Case fatality was very low in those receiving antibiotics.

The study conducted to study the effectiveness of the strategy advocated by W.H.O. revealed that the strategy works and substantial reduction in under-fives and ARI related mortality were observed. The reduction was more pronounced in 1-4-year-olds.

In conclusion, I would like to say that ARI is a major problem in the community and WHO strategy works if implemented well.

Problem of A.R.I. in India

- K.K. Datta*
- Uma Chawla**

ARI is defined as an episode of acute symptoms and signs resulting from infection of any part of respiratory tract or any related structure including sinuses, middle ear and pleural cavity. It is a major public health problem in the country. Data from Central Bureau of Health Intelligence, Registrar General of India as well as community based longitudinal studies s show that 15-34 per cent of all childhood deaths are attributable to ARI(1). The extent of morbidity and its attending sequelae like impaired nutritional status,depressed pulmonary function and its effect on Cardio vascular system and the high mortality it presents when considered together will point to the fact that the ARI constitutes a tremendous burden not only on the existing health services but also on the community at large.

Population based longitudinal studies involving fortnightly active surveillance in different parts of the country indicate that a child in urban areas on an average may suffer from 5-8 episodes of ARI per year during the first 5 years of life(2). In rural areas the reported incidence per child is lower(3). On an average taking urban and rural areas together a child below five years suffers from 2-5 episodes of ARI per year. According to an estimate, some 7.5 lakh children under the age of 5 die of ARI in India annually(4). Although the incidence of ARI in India and in Western countries is the same, the risk of dying of an Indian child of ARI is 30-75 times more than that of a child in the USA as shown by comparative study statistics from USA and India.

---

* Deputy Director and Chief, Epidemiology Division, National Institute of Communicable Diseases, Delhi-110054.

** Assistant Director(Epidemiology), National Institute of Communicable Diseases, Delhi-110054.

Traditionally, ARI is classified anatomically according to site of involvement: upper respiratory infections including Pharyngitis, mid-respiratory infections including Epiglotitis and Laryngotracheo bronchitis and lower respiratory infections includin Broncheolitis and Pneumonia.

But from the management point of view simpler classifications in the form of mild (cough and respiratory rate below 50 - child requiring supporting measures only) moderate (cough with respiratory rate above 50 - home care and antibiotics) severe (cough and respiratory rate above 50 and Chest in-drawing and/or inability to drink - child requiring referral to a health facility) are used.

WHO estimates(5) mortality rate of 84.3 per 100,000 populatic for Asian countries. It is expected that in India, also the situation will be similar.

In the context of above, the division of Epidemiology of National Institute of Communicable Diseases undertook two studies in recent times:

(i) A multi-centric study involving six branches of NICD were undertaken to determine ARI related mortality and morbidity and the places selected for the study were Delhi, Alwar, Coimbatore, Varanasi, Patna, Calicut, East Godavari.

(ii) A study was undertaken in Najafgarh area of Delhi to find ARI morbidity.

The findings are presented in this paper.

Multicentric Study

(i) An integrated survey of ARI, Diarrhoea and EPI was taken in seven places, as indicated above, based on the basis of standard WHO cluster sample technique.

(ii) Interview of households was done using a standard proforma recording the number of children below the age of 5, the number who had ARI defined as cough, runny nose, Otitis media, sore throat, fast breathing or chest indrawing and no. of ARI related deaths during the last 1 year.

Study at Najafgarh

Five villages were taken up under Ozwa P.H.C. and all the households were interviewed by medical officers and the requisite information was recorded in a standard pretested proforma. ARI was defined as given in the multi-centric study. Information regarding occupation of the households, economic status of the households, sex of the child, literacy of the mother were also collected.

Results

Table 1 gives two week's incidence of ARI in children in multicentric study involving seven areas (four rural and three urban areas). The episodes of ARI per child/year was found varyin from 2.0 to 5.4. The overall incidence of ARI was found marginall higher in the age-group of 0-1 as compared to the older children. However, in five of the seven study areas, ARI was found higher in the older children and in the other two places higher ARI was recorded in infants.

Table II gives ARI related mortality in a multi-centric study. Higher mortality (7.04 per 1,000 children per year) was observed in infants as compared to the older children

(1.29/1000 per year). The overall ARI related mortality was found to be 2.53 per 1,000 children under 5. It gives an estimated 0.3 million ARI deaths in India under the age-group of 5.

Table 111 gives ARI episodes in male and female children observed in five villages under Ojawa PHC, 3.4 episodes of ARI per child below 5 years of age per year were observed. There is no difference observed in ARI incidence amongst male and female children.

Table IV gives incidence of ARI in children below 5 years of age in different households belonging to the different occupationa groups. Three occupational groups were considered - labourers, agriculturists and service-class. The labourers are the poorest having no land of their own and earning their livelihood while working in agricultural fields. Agriculturists have lands of their own and are better off. Service class people are economicall the most well-placed. The highest rate of ARI episodes per child/ year was observed amongst the labourers (4.6 episodes per child/yea and the least was observed amongst those households belonging to service class (2.6 episodes per child/year).

Table V gives the ARI in children with reference to the literacy of the mother. Higher episodes of ARI were observed in children whose mothers were illiterate (4.1 episodes per child/ year), whereas a lower incidence of ARI was observed amongst children having literate mothers (2.5 episodes per child/year).

Discussions

The observation of 2.0 to 5.4 episodes of ARI per child/year fits in well with the observations of other authors (2,3). Vijay Kumar(6) observed a lower incidence of ARI during infancy as compared to the older children in a rural areas of Haryana

In this study, the authors have observed overall higher incidence of ARI in infants. Kamat et al.(7) observed a higher incidence of ARI in infants in urban areas. Interestingly in this study the authors observed a higher incidence of ARI in infants only in one of the three urban areas. In the rural set up, the authors observed a lower incidence of ARI in infants in three of the four rural areas studied. In Najafgarh (Rural area of Delhi U.T.) a lower incidence of ARI was observed in infants. A higher incidence of ARI was observed in children in urban areas compared to rural areas (P value $< .001$) in the multi-centre study. This difference in the observations is rather difficult to explain. Possibly several factors like over-crowding, feeding habits, different kitchen practices, climatic conditions, environmental pollution, etc. play some roles. In most of the study areas these parameters are not uniform and hence the difference.

The incidence of 2.53 overall ARI related deaths per 1000 children (below the age of 5 years) per year appears to be low. However, the range was found varying from 1.02 to 6.27. WHO estimates 0.6 to 0.7 million children under the age of 5 dying of ARI in India every year(6). If the result of this study is projected for the entire country, the estimated number of childhood deaths per annum due to ARI would be 0.3 million. However, as the range varied widely, this will not be proper to make estimate projected for the entire country based on this study. The study in Punjab indicated the estimated figure of 0.75 million childhood deaths annually in India from ARI(4). The authors observed that to indicate the estimated figures based on isolated surveys is not scientifically rational. Therefore, if a National ARI Control Programme is to be launched, the question of undertaking a sample survey covering the entire country should be considered. Though there is no doubt that sufficient data is available to indicate the magnitude of the ARI problem in the country, yet the initial baseline data would be helpful.

No difference was observed in the ARI incidence among male and female children. It may be mentioned here that so far the incidence of ARI is concerned, there is a little difference among the developed and the developing countries. However, the risk of dying of an Indian child of ARI is 30-75 times more than that of a child in USA (8,9).

ARI is known to occur more amongst the people of poor socio-economic group. In this study, ARI was found significantly higher in the lower socio-economic group i.e. among the labourers as compared to the other groups. Amongst the labourers the 2-week attack rate was found to be 31.5 per cent, whereas in service class, it was found to be 18.0 per cent only. The difference was highly significant ($p < 0.001$).

The ARI Control Programme has a significant component of health education. If the children are treated early, the morbidity/mortality could be reduced to a great extent. If a mother could be educated to understand the early danger signs of ARI then mortality could be reduced substantially. In fact, this study has shown that ARI is much less in children whose mothers are literates. In this study, 4.1 episodes of ARI per child per year was observed amongst children whose mothers were illiterate, whereas the same was found to be only 2.5 episodes per child per year amongst children whose mothers were literate.

Conclusions

1. The incidence of ARI amongst children below 5 years was found to be high, varying from 2 to 5.4 episodes per child per year.

2. In urban area, the incidence of ARI is higher as compared to the rural area.

3. In some places ARI was found more in infants as compared to the older children and in some places just the reverse was found. The difference is not properly explicable.

4. It is not scientifically rational to make an estimate of ARI deaths projected for the entire country based on isolated surveys. It is suggested that if a national programme is to be launched a country-wide sample survey could be considered to obtain the baseline data applicable for the entire country. However, the authors are of the opinion that enough data is available at present to understand the gravity of the problem of ARI to launch a national programme for control.

5. No sex difference was observed with regard to ARI amongst male and female children.

6. The incidence of ARI was found significantly higher in poorer households as compared to those who are better off.

7. ARI was found less in children whose mothers were found to be literate.

REFERENCES

1. Sharma R.S., Datta KK and Datta Mahendra (1987).
A longitudinal study on morbidity and mortality among rural pre-school children in Rajasthan (In press).

2. Datta-Banik ND, Krishna R, Mane SIS, Raj L. (1969).
A longitudinal study of morbidity and mortality pattern of children under the age of 5 years in an urban community.
Ind. J. Medical Research. 57: 948-957.

3. Gupta K.B., Brown KM, Beckers, Yunus M. (1982).
Longitudinal studies of infectious diseases and physical growth of children in rural Bangladesh.
Am. J. Epidemiol, 115: 305-314.

4. Gordon J.E., Singh S, and Wyon B. (1965).
Causes of deaths at different ages by sex and by season in a rural population of Punjab, 1957 -1959.
Ind. J. Med. Res. 53: 906.

5. Narain J.P., Banerjee, K.B. (1987).
ARI in India: Public Health Significance and Epidemiology.
Paper presented in the Workshop held at NICD, Delhi (27th-30th April, 1987).

6. Kumar Vijay (1987). Epidemiologic methods in acute respiratory infections.
Ind. J. of Pediatrics. 54: 205-211.

7. Kamatt K.R., Feldman, R.A., Sunder Rao PSS, Webb JKG (1969).
Infection and disease in a group of South Indian families.
General morbidity pattern in families and family members.
Am. J. epidemiol. 89: 375.

8. World Health Organisation (1981)
World Health Statistics Annual - Geneva. p - 226.

9. Government of India (1980).
Survey on Infant and Child mortality - 1979. A preliminary report Registrar General of India, Ministry of Home Affairs, New Delhi.

Table 1

Two-week Incidence of ARI in Children (0-4 years)
A Multicentric Study

Place	Survey Population in Years			2-Week Incidence in Percentage			Episodes Per Child Per Year
	0-1	1-4	0-4	0-1	1-4	0-4	
Delhi* (Urban)	2981	11,155	14,136	12.8	13.8	13.6	3.5
Varanasi* (Urban)	3580	10,008	13,588	28.1	18.0	20.7	5.4
Calicut (Rural)	2657	10,870	13,527	10.6	16.4	15.2	2.0
Patna* (Rural)	3282	10,428	13,710	19.7	13.0	17.8	4.6
East Godavari (Rural)	2380	11.540	13,920	14.2	19.2	18.4	4.8
Coimbatore (Rural)	2373	11,339	13,712	6.2	14.2	12.8	2.8
Alwar	3472	10,233	13,705	18.3	21.5	20.7	2.3
Total	20,725	75,573	96,298	16.6	15.8	15.9	4.1

Table II

ARI-related Mortality (Multi-centric Study)

Age group (in years)	Population surveyed	No. of deaths	Mortality rate/1000
<1 years	20,725	146	7.04
1-4 years	75,573	98	1.29
Total	96,298	244	2.53

Estimated deaths due to ARI in 0-4 years in India a little over 0.3 million..

Table III

ARI in Male and Female Children Under-five Morbidity Study, [illegible], Ujawa, December 1988

Age in months		Number	Case	Attach Rate(%)	Episodes ch/Yr.
Male	0-60	978	229	23.4	3.4
Female	0-60	942	223	23.7	3.5
Total		1920	452	23.5	3.4

Chi-Square insignificant

With correction factor for seasonal variation

Table IV

ARI in Children and Family Occupation
PHC Ujawa, December 1988

Occupation	Number	Cases	Attack Rate%	Episode Ch/Year.
a.Labourer	684	216	31.5	4.6
b.Agriculturer	705	140	19.8	2.9
*c.Service Class	531	96	18.0	2.6
Total	1920	452	23.5	3.4

Chi-square 38.02 df-2 P Value-.001

*Service class = Govt. as well as private

Chi-square between b and c = 0.6

With correction factor for seasonal variation

Table V

ARI in Children and Literacy of Mother
PHC Ujawa, December 1988

Literacy of mother	Number	Case	Attack Rate %	Episode Ch/Year
Illiterate	1127	318	28.2	4.1
Literate	793	134	16.9	2.5
Total	1920	452	23.5	3.4

Chi-square 33.4

P- value 0.001

With correction factor for seasonal variation.

SECTION IV

RESEARCH PAPERS

Prevention of Acute Respiratory Infections in Children in ICDS Projects

- T. Rajagopal*

Acute Respiratory Infection (ARI) accounts for as many as a third of all deaths among the under-fives in India. Severe infection as Pneumonia kill as many as 720,000 children in India. A child suffers an average 3 to 6 bouts of ARI a year. Although most of these episodes are mild and self limiting, about 10 to 15 per cent may become severe, with a case fatality rate of 5 to 10 per cent.

The younger the age, the higher is the incidence of mortality and Morbidity. Every 8th second one child dies of ARI and this is a major contributing factor of IMR.

Annual Under-five Deaths - Developing Countries: 1987

Diseases	Deaths in Millions (14)
Diarrhoeal Diseases	5.0
Acute Respiratory Infection	2.9
Measles	1.9
Malaria	1.0
Tetanus	0.8
Other	2.4

ARI Mortality - Under-five Years of Age

(Developing Countries)

- 50 per cent total death occurs in children 5 years.
- 15 million die every year under 5 years.
- 10 million die during Infancy.
- 5 million die due to ARI.
- 90 per cent of ARI death - Developing countries.

*Additional Professor (Pediatrics), Madurai Medical College Madurai and Consultant - ICDS - Nilakottai.

ARI control is technically feasible based on epidemiological etiological and case management experience. About 60 per cent of severe cases are caused by Bacterial and are amenable to Anti-Microbial therapy. Many deaths can thus be avoided if Anti-Microbial agents are made available to Health Workers.

The Nilakottai Rural ICDS Block has a population of nearly 1.4 lakhs. This has the pride of being one of pilot projects started as early as 1975-76. UNICEF has taken up Nilakottai as a Pilot Project in launching the ARI Programme. A baseline survey was done in selected Anganwadi areas to note the prevalence of ARI with a special emphasis on the preventive aspects.

Survey of ARI Cases at Nilakottai ICDS Area

Sl. No.	Total No. of child surveyed	Mild ARI	Moderate ARI	Severe ARI	Primary Complex	Total ARI
1.	321	88	15	-	2	105
2.	210	167	-	1	2	170
3.	340	220	17	-	3	240
4.	154	62	-	-	4	66
5.	375	100	75	3	-	178
6.	280	182	55	1	2	240
7.	195	76	11	5	-	92
8.	150	83	-	-	-	83
9.	412	177	-	9	1	187
10.	250	144	-	6	-	150

Out of the 14 cases of Primary Complex, nine cases had a definite contact history of open tuberculosis in the household. Many children were from unsanitary housing condition.

Encouraging mothers to continue breast-feeding, giving ample fluids and cleaning childrens' nose and ear discharge has definitely prevented the children from getting milder and severe forms of ARI. The triggering factors include the child rearing practice in that area, viz., the habit of head bath with application of oil into nose, ears and eyes. The other practice that is prevalent in this part as the removal of secretion from the nose by using mouth. Close contact with parents, grandparents having chronic respiratory illness, overcrowding, smoke pollution are other contributing factors.

Immunisation against measles has a definite implication in the prevention of ARI. This was made clear by a comparative study of the rate of ARI infection in children immunised against measles compared to those children who were not immunised in 2 consecutive villages. Measles is a menace in the contribution of ARI because of the beliefs, superstition and deprival of medical attention. Twenty per cent of severe Acute Respiratory Infection is due to complications of measles. This goal of immunisation against measles will be achieved by the UIP Programme being undertaken by the Government of India.

The social factors include improvement in housing, personal and environmental hygiene. The Housing Board has provided good ventilated houses in certain areas. Smokeless chulas are provided in certain parts of the block. Segregation of infective cases, wherever and whenever possible, will prevent the spread of respiratory infection in the children.

To have a successful launching of this ARI programme, the following are recommended.

All the cases of potentially life threatening ARI should be detected before they have become too severe and were treated with anti-biotics by the village Level Health Workers. The Health Worker should have an important role in hospital referral services to facilitate early hospitalisation and prevention of complications.

Health education of mothers to seek medical care more often and more conscientiously. The villagers can be adequately trained to diagnose different grades of ARI and then reduce ARI mortality by effective case management techniques.

Finally, most preventive measures are difficult and expensiv Such measures as improving housing, reducing smoke and limiting respiratory Pathogens require money, social change or both. Simple methods are especially needed to protect babies from cold. This can be achieved by improving housing condition and health education of mothers and first line Health Workers. The mothers must be encouraged to continue breast-feeding during the attacks and also to take care of the nutrition of the children. The identification of high-risk infants and avoiding trigger factors also have a major role in the prevention of ARI.

Since ICDS has a good infrastructure and the personnel invol in it are trained in programmes like Diarrhoeal Disease Control. With their good rapport with the community, the implementation and prevention of ARI programme can be successfully launched.

- P.V. Aswath*
- N. Shantharam**
- S.A. Vastrad***

A pilot project to control Acute Respiratory Infections in rural area at the Primary Care Level using the existing, available functionaries in an ICDS. Project was implemented in October 1988. The project was sponsored by UNICEF.

Topography & Physiognomy: The ICDS block is situated 8 to 14 KM around Karnatak Medical College, Hubli. It has a typical South Indian villages. The main occupation of the people is Agriculture. The main crops are Jawar, Chillies and Cotton. The average annual temparature ranges from 23°C to 40°C. The average rainfall is about 40 CM per year. The area has one National highway, one State highway and about 30 kutcha roads, connecting the villages. Hubli - Dharwad is the only city in the block. The area does not have forest, hills and rivers, but for a small stream.

Objectives: The objective of the study was to assess the feasibility of using the existing ICDS functionaries in the control of ARI at the Primary Care Level.

Methodology: The entire project was implemented in two phases. The first phase was training and the second implemention of the programme.

The training was done in two stages. In the first stage, the trainers and participating Medical Officers of Health were trained by UNICEF. In the second stage, 105 Anganwadi Workers, 25 ANMs. and 4 LHVs were trained in the Karnataka Medical College,

---

* Professor and Head of the Department
** Assistant Professor
*** Lecturer
Karnataka Medical College, Hubli.

Hubli and at the PHC level also by UNICEF trained faculty members using UNICEF guidelines and a training module in vernacular language (based on W.H.O. module). The contents of the curriculum were:

- Identification of A.R.I.
- Management of the case
- Referral

The duration of training was two days.

In the second phase the trained Anganwadi Workers were supplied with the module, paracetamol, co-trimaxozole and monthly monitoring reports, and were asked to implement the control Programme and send M.M.R. to the department of Preventive and Social Medicine. The reports were scrutinised, verified and edited in the field by the trainers. The period of implementation of the project was from 16th October to December 1988.

Results of the Study

There were 103 Anganwadis reporting from the Hubli rural ICDS block. The total population of the block was 99.603. The child population of 0-6 years was 16,876. The results of the study were applicable to 0-6 years old children of the block.

Table 1

Nature of A.R.I.	Incidence During						Total
	*October		November		December		
	No.	Per.	No.	Per.	No.	Per.	
Mild	62	82.7	179	83.2	203	88.3	444
Moderate	8	10.7	29	13.5	19	8.3	56
Severe	5	6.6	7	3.3	8	3.4	20
	75	100.0	215	100.0	230	100.0	520

* Cases from 16th to 30th are reported.

This table shows monthwise incidence of A.R.I. In all there were 520 cases during that period. The percentage distribution of cases in December was higher among mild cases.

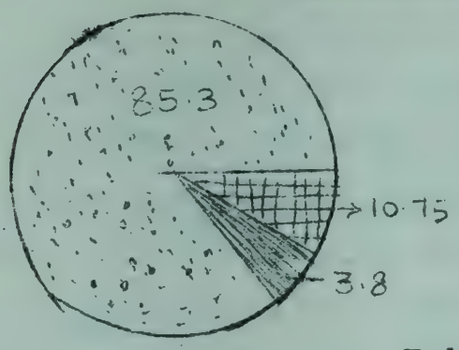
Table 2

Incidence Rates of A.R.I.

Nature of A.R.I.	Cases		Incidence per 1000 Popln.
	No.	Percentage	
Mild	444	85.38	40.32
Moderate	56	10.77	5.15
Severe	20	3.85	1.84
Total	520	100.00	47.81

The incidence of mild A.R.I. among rural children of 0-6 years age was 47.81 per 1000 and 85.38 per cent of total A.R.I. The severe A.R.I. was only 1.8 per 1000 children, contributing 3.85 per cent to the total A.R.I. cases.

Pie Diagram Showing Distribution of A.R.I. Cases in the ICDS Block



Legend

Mild

Moderate

Severe

Table 3

Management of A.R.I. Outcome*

Management	Outcome		Total
	Cured	Referred	
Home care with household remedies	+425	29	454
Home Care with co-trimoxozole	49	7	56
Total	474	36	510

* Outcome of 10 serious referred is not included,
\+ 19 cured mild cases were taken to doctors by relatives.
X2 df 1 after yate correction 1.79 p 0.05

This table suggests 7.05 per cent of all the total cases managed by Anganwadi Workers required referal services. Home care with household remedies could cure 89.66 per cent of all the cases and remaining cases required addition of cotrimaxozole. Of the household remedies and home cure group 6.4 per cent required referal and in the other group 12.5 per cent required referal.

The management of A.R.I. and referal are independant of each other

Table 4

Action Required by Anganwadi Workers

Nature of A.R.I.	Referal		Total
	Required	Not required	
Mild	39	405	444
Moderate & Severe	26	50	76
	65	455	520

X^2 d. fl = 36 p $<$ 0.001

This table suggests that 12.5 per cent cases of A.R.I. require referal services of this mild category, 8.81 per cent required referral and in the other group 35.53 per cent required referral services. The nature of A.R.I. and referral requirement are satistically associated.

Discussion

Indentification A.R.I. has improved from October to December. It is also observed that the highest percentage of mild cases were seen in December. The overall mild cases were 85.38 per cent and severe cases were only 3.85 per cent of total cases.

Of all the ARI cases occurred, 92.25 per cent could be handled by Anganwadi Workers. Of the ARI cases treated, 89.66 per cent required home remedies and home care at the primary level.

The overall referrals required were 7.05 per cent of total cases. Among home care with co-trimaxozole group the referral of 7 cases gave the referral percentage as 12.6 per cent as late referral which amounts to error. This group had 10 severe cases which were referred but were unable to go. Since 7 cases of late referral came from the severe groups, the error noted is only an artifact. This suggests the serious error of non-referral of severe ARI did not exist.

The case fatality rate among 76 moderate/severe cases was 3.94 per hundred, which is low and mends the capability of Anganwadi Workers.

Conclusion

Since 92.25 per cent of cases could be handled by Anganwadi Workers and the error in judgement by them is marginal with further scope of reduction, the Anganwadi Workers can be used to control in ARI. This reduces the workload of hospital and minimises the patient's family difficulties. Continuous monitoring improves the quality of work.

Acknowledgement

Authors are highly thankful to UNICEF for funding this project and to those Anganwadi Workers who participated in the above project.

Extent of Problem of ARI in Rural Area in ICDS-Block and Preparing Manpower to Fight ARI

- Sunder Lal*

Registrar General of India as well as Community Based Longitudinal Studies show that 15-34 per cent of all childhood deaths below 5 years of age are attributable to ARI. Morbidity due to ARI during early childhood period is quite high and poses serious problem of growth faltering, malnutrition as also multitude of other related problems such as ear discharges and sub acute bacterial endocorditis etc. Quite a large number of of ARI are preventable through timely immunizations. Planning to fight ARI on the national scale requires correct estimates of the problem for allocation of resources.

The present longitudinal study was carried out in the Community Development block Kathura during the period of April 1984 to March 1985. The objective of this study were:

- To know the sickness load during early childhood period (0-3 yrs.).
- To know the nature of sickness and their average duration.
- To monitor weight loss following these sicknesses.

This longitudinal study covered 37 AW areas, having a population of 39141. All these AWWs were imparted one week training to identify the sicknesses, their management and timely referrals, as also growth monitoring of young children. The study was conducted over a period of one year to capture the seasonal variations of the incidence of diseases. In all 1039 infants and 1239 children between 1-3 year of age were followed and morbidities recorded every week on the pretested format. The Life Table method of analysis was adopted to arrive at various rates.

---

* Associate Prof. & Head of Social and Preventive Medicine Department, Medical College, Rohtak.

Observations

One thousand thirty-nine infants could be followed for 21975 weeks and similarly children in their second and third year of life contribution 17930 and 11230 weeks of follow-up. Average weeks of follow-up varied from 21.15 to 25.17 for the morbidity study. Approximately one-third of the weeks were reported as sick weeks. Children between 1-2 years of age reported a higher proportion of sick weeks (38.45). During the period of infancy, the second and third year of life 17.05, 17.79 and 16.06 episodes of sickness per annum were recorded respectively.

Of 17.05 annual episodes, 4.95 episodes were due to cough during infancy. During the second year of life, out of 17.79 episodes 6.13 were cough episodes and during the third year of life of 16.06 episodes of sickness experienced, 5.45 were due to cough and cold. Over 50 per cent of the children experienced cough and cold during infancy and during the second and third year of life over 75 per cent experienced cough and cold episodes.

On an average, each episodes of cough and cold lasted for 4.13 days during infancy, 5.65 days in the second year and 4.40 day during the third year of life. On an average child was down with cough and cold for about 22 days in a year. Around 15.19 per cent of children experienced weight loss ranging from 300-600 Gram following episodes of cough and cold. Whenever the child had concommitent illness like diarrhoea and fever as many as 28.03 per cent of children experienced loss of weight (300-600 G). Fifty-seven infants died during the course of study, 15.79 per cent of them died due to ARI, and similarly of 17 deaths between 1-3 years age group 5.88 per cent due to cough and cold.

Conclusion and Discussion

Limited epidemiological data of this study draws our attention that cough and cold is the leading cause of morbidity in young children (0-3 years of age). Around 15.79 per cent of infant die of coughs and cold in this situation, where the immunisation coverage for DPT (80.6) Measles (60.37) and B.C.G. were 77.8 per cent. Repeated attacks of cough and cold led to malnutrition as each episode costed weight loss ranging from 300-600 G.

Standard management of ARI is needed most to prevent mortality and fast recovery. Case management at the level of AWW, Subcentre and PHC revealed universal practice of administrati of wide ranging antibiotics, (Sulphadiazine and Broadspectrum antibiotics) in all cases of coughs and cold. In the health centre situation the ARI infections were labelled as URI, cough Pneumonia, Bronchitis, Rhinitis etc. In anganwadi settings and Subcentre the ARI infections are labelled as cough and cold; 15.80 per cent of all cases reporting to AWW are due to cough and cold.

Team leaders (Medical Officers and CDPOs), six batches totaling 80 were trained at Medical College, Rohtak for management and prevention of ARI. Material used for training included Video Casettes on ARI (UNICEF) and Slide (TALC) sets. Reception of Slides and Video-Cassettes was good and appreciated by medical officers. Same training was extended to the district level Medical Officers, and so far we have covered 6 districts, where 200 doctors were trained. How then the doctors train their health teams is a critical question? It should become part of continuing education programme. At the community level the mothers and parents need to be educated to develop concern for ARI and practice of home management of ARI can go a long way in prevention and early recovery. ARI should become part of primary health care strategy.

References

Acute Respiratory Infections, Epidemiology and Control.
National Institute of Communicable Diseases DGHS.
22 Sham Nath Marg, New Delhi - 1988.

Table I

Total Number of Children

Included in the study	No. of children in age groups		
	0-1 year	1-2 years	2-3 years
1. At the begining of the study	495	358	176
2. No. born/reached particular age (Birth/Incoming)	524	436	269
3. Moved into the village	-	-	-
4. New registrations (other than 2-3)	-	-	-
Total	1039	794	445

Table II

Weeks of Follow-up

No. of children in ages	Total no. of Weeks	Average (Wk/child)
0-1 year	21975	21.15
1-2 years	17930	22.58
2-3 years	11203	25.17

* Add the number of weeks every child in the particular age group has been followed up for the morbidity study.

CH135 N84
05786
COMMUNITY HEALTH CELL
LIBRARY AND DOCUMENTATION UNIT

Table III

Weeks Reported Sick

Age group	No. of children	Sickness + ve*		Sickness Free*	
		No. of weeks	% age	No. of weeks	%age
0-1 year	1039	7230	32.90	14745	67.10
1-2 years	794	6894	38.45	11036	61.55
2-3 years	445	3348	29.89	7855	70.11

* No. of sickness + ve or sickness free weeks will be out of the total no. of weeks of follow-up mentioned in Table - 2.

Table IV

Sickness Load - Average Episodes

Age Group	Sex	Total No. of weeks of follow-up (a)	No. of episodes (b)	No. of children (c)	Episodes/Yr (=b/ax52)
0-1 year	Male	11482	3768	543	17.06
	Female	10493	3437	496	17.03
	Total	21975	7205	1039	17.05
1-2 years	Male	9510	3181	427	17.40
	Female	8420	2953	366	18.23
	Total	17930	6134	794	17.79
2-3 years	Male	6559	1623	257	12.87
	Female	4644	1243	188	13.92
	Total	11203	2866	445	13.30

Table V

(0-1 year)

Days Suffered Per Episode of Illness

(April 84 to March 85)

Morbidity condition	No. of episodes	Days suffered	Days per episodes
Diarrhoea	2060	8004	3.88
Cough & Cold	1601	6618	4.13
Fever	1752	5711	3.26
Fever with rash	73	929	12.73
Tetanus	-	-	-
Poliomyelities	1	52	52
Ear discharge	86	1505	17.50
Conjunctivitis	1152	4221	3.66
Boils	213	1717	8.06
Scabies	26	173	6.65
Cuts/Wound	15	282	18.80
Accident			
Other	226	1656	7.33
Total	7205	30868	4.28

Table VI

Days Suffered Per Episode of Illness (1-2 years)

(April 84 to March 85)

Morbidity condition	No. of episodes	Days suffered	Days per episodes
Diarrhoea	1370	5698	4.16
Cough	1632	9219	5.65
Fever	1667	6675	4.00
Fever with rash	68	1238	18.21
Ear discharge	152	4440	.
Boils	407	7056	17.34
Conjunctivitis	626	3391	5.42
Scabies	69	667	9.67
Cuts/Wound/Accident	55	681	12.38
Others	88	1531	17.40
Total	6134	40596	6.62

Table VII

Days Suffered per Episode of Illness (2-3 years)

(April 84 to March 85)

Morbidity condition	No. of episodes	Days suffered	Days per episodes
Diarrhoea	556	2150	3.87
Cough	784	3453	4.40
Fever	686	2098	3.06
Ear discharge	62	1360	21.93
Fever with rash	37	657	17.76
Conjunctivitis	355	1109	3.12
Boils	236	2836	12.02
Scabies	30	233	7.77
Cuts/Wound	46	652	14.17
Others	74	718	9.70
Total	2866	15266	5.33

Table VIII

Average Episodes Per Sick Child (0-1 year)

Morbidity condition	No. of children a	No. of episodes b	Episodes/ child b/a	Episodes/ year b/ax52
A. Diarrhoea	784	2060	2.63	5.98
B. Cough	663	1601	2.41	4.95
C. Fever (no rash)	724	1752	2.42	5.23
D. Fever (with rash)	65	73	1.12	3.20
E. Tetanus	-	-	-	-
F. Paralysis of limb	1	1	1.00	1.08
G. Ear discharge	36	86	1.53	2.49
H. Sore eye	498	1152	2.31	4.55
I. Skin boils	150	213	1.42	2.50
J. Scabies	25	26	1.04	1.87
K. Cuts/Wounds/ Accidents	22	15	0.68	2.10
L. Any other	181	226	1.25	2.54
Total: Sick Children	958	7205	6.93 per child	17.05

Table IX

Average Episodes Per Sick Child (1-3 years)

Morbidity condition	No. of children a	No. of episodes b	Episodes/ child b/a	Episodes/ year b/ax52
A. Diarrhoea	772	1926	2.49	5.04
B. Cough	908	2416	2.66	5.45
C. Fever (no rash)	872	2353	2.70	5.70
D. Fever (with rash)	94	105	1.12	2.02
E. Tetanus	-	-	-	-
F. Paralysis of limb	-	-	-	-
G. Ear discharge	158	214	1.35	2.42
H. Sore eye	483	981	2.03	3.90
I. Skin boils	417	643	1.54	2.83
J. Scabies	79	99	1.25	2.07
K. Cuts/Wounds/ Accidents	92	101	1.10	1.89
L. Any other	118	162	1.37	2.41
Total: Sick Children	1130	9000	7.26 per child	16.06

Table X

Cause of Death

Cause	Number	Percentage
Prematurity	19	33.33
Diarrhoea	14	24.57
Fever	11	19.31
Pneumonia	8	15.79
Tetanus	2	3.50
Birth Injuries	1	1.75
Asp. Pneumonia	1	1.75
Marasum	1	1.75
Total	57	100.00

Table XI

Cause of Death (age group 1-3 years)

Cause	Number	Percentage
Fever	8	47.06
Diarrhoea	7	41.18
Pheumonia	1	5.88
Marasmic (PCM)	1	5.88
Total	17	100.00

Some Epidemiological Features of Acute Respiratory Infections in West Bengal

- A.K. Chakraborty*

Acute respiratory infections (ARI), diarrhoeal diseases and malnutrition are the leading causes of morbidity and mortality in children under 5 years in developing countries. While diarrhoeal diseases and malnutrition are considered priority problems, until recently acute respiratory infections have received little attention. Recent studies conducted in various parts of India have revealed the gravity of the problem. It is estimated that more than 600,000 children under 5 years die each year due to ARI. Early case detection and prompt treatment can substantially reduce deaths from ARI. India is a vast country with different climatic conditions, cultural variations and varying socio-economic conditions. In this paper, some epidemiological features of ARI, as observed by several investigators in the state of West Bengal have been presented.

ARI in the State of West Bengal

Mortality: Annual Reports of Registrar General of India showed that 16 to 24 per cent of all deaths in rural West Bengal were due to cough (disorders of respiratory system) during the period 1978-1982 and these were the leading cause of death. For the whole country deaths due to cough accounted for 19.7-22.0 per cent of total death during the period 1973-85. Among the deaths due to pneumonia, 34.4 per cent occurred in children below one year; 25.4 per cent in children between 1 year and 4 years.

Prof. of Epidemiology, All India Institute of Hygiene Public Health, Calcutta.

Mortality in Rural and Urban Areas of West Bengal

Health Surveys conducted in the rural area under Rural Health Unit and Training Centre, Singur (Hooghly district) showed that pneumonia accounted for 4.2 - 10.3 per cent of all deaths during the year 1944, 1957 and 1975 as against 14.2 per cent in Urban Health Centre, Chetla, Calcutta during 1972. In the rural area, diarrhoea was the leading cause of mortality, but in the urban area, pneumonia was the leading cause. It was thus obvious, the problem of pneumonia was more serious in urban area (Source: Chakraborty et al 1978, Indian J. Med. Res. 68, 1018).

ARI among Hospitalised Children Under 15 years

During the period from July 1982 to June 1983, 4179 children below 15 years were admitted in Burdwan Medical College Hospital at the district headquarters which caters the need of rural population as well. Out of all admissions 646 or 15.5 per cent (out of 497) of the deaths were due to these disease. ARI thus put a serious strain on health services. Among the ARI cases, 419 or 64.9 per cent were infants, number of patients sharply declined thereafter.

Acute respiratory illnesses may be severe and fatal as was seen from ARI associated case fatality rate of 7.4 per cent in Burdwan Medical College Hospital (Source: S.N. Bose, A.K. Das, 1984, Indian J. Pub. Hlth., 28, 194). Several other studies among hospitalised patients in India showed case fatality rate varying from 5 to 10 per cent.

Community-based Morbidity Study

Community-based longitudinal studies have indicated that ARI is indeed very common and a major cause of childhood morbidity. In a longitudinal study of 156 children from birth to 18 months in Urban Health Centre, Chetla average episodes of ARI per year were found to be 7.5. Other studies in urban areas have also shown 5-6 episodes of ARI per year during the first five years of life. (Source: D.K. Mukherjee, 1979, Indian J. Pub. Hlth., 23, 17). In another longitudinal study on 200 children for a period of 12 months in the rural area of Singur, average episodes per child per year were 3.2, lower than that in the urban area. Fewer of episodes of ARI in rural areas was observed, in other parts of the country (Source: Deb., 1987 Thesis, Longitudi study of morbidity in children under 5 years).

Seasonal Variation of ARI

In the Rural Health Centre, Singur, ARI occurred throughout the year with slight rise before and during monsoon season. Similar observations were made by Johns Hopkins Group of Workers (Source: Deb, loc cit). But in North India peak incidence of ARI was noted during winter months.

Risk Factors

In the developed countries ARI associated mortality declined markedly during recent decades as a result of widespread use of antibiotics in treatment, immunization with DPT, measles and influenza vaccines, improved health care and adequate nutrition for children. In the developing countries, on the other hand, no such change has occurred as factors which increase the risk of severe respiratory infections in children continue to exist.

Important factors that predispose a child to severe ARI are low birth weight, malnutrition, lack of immunization, lack of breast-feeding, poor socio-economic factors, such as low income, poor parental educational level, big family size, poor housing, over-crowing, air pollution and low utilization of health care facilities. Mortality due to ARI during the first year of life has been found such higher in low birth weight infant than those weighing more than 2500 gms. at birth. Pneumonia is the leading cause of death in these children. Since about 30 per cent of the new born in India have low birth weight, a high proportion of these infants once infected are prone to death from pneumonia. Average duration of illness per child was 8.8 days in Singur (Source: Deb, Loc cit).

Measles, diphtheria, whooping cough and tuberculosis can be prevented by immunization. In Singur 93.27 per cent of the children under 1 year were fully immunized with DPT and 77.3 per cent with BCG. Coverage with measles immunization was poor. Recurrent outbreaks of measles have been observed in that area (Source: Garai & Chakraborty, 1980, Indian J. Pub. Hlth., 24, 150)

Environmental Factors

It has already been observed that death due to ARI were much higher in Calcutta (14.2%) than those in Singur (4.2 - 10.3%). In a study in Bombay, a higher proportion (26%) of persons having common cold were from areas where there was heavy air pollution compared to those in other areas (11.14%). Some studies in the developed countries showed that air pollution was associated with an increased incidence of acute lower respiratory infections. Over-crowding in the house plays an important role in transmission of infectious agent. Incidence of ARI has been found higher in large families (five or more in one room) than that in small families.

Utilization of Medical Facilities

ARI associated mortality can be reduced to a great extent if prompt treatment is given to children.

In singur area, it was observed in a longitudinal study for one year that among the sick children, the majority (56.5%) availed medical facilities from local practitioners who did not have formal medical education. A fairly large number of children (41.0%) attended Health Centres.

But in the case of infants, the majority (41.4 per cent) were found to be attended by homeopathic physicians during the illness.

Conclusion

The problem of ARI in West Bengal is as serious as in other parts of the country. Lives of many children can be saved, if ARI cases are detected early and treated promptly. In the rural areas since a large number of patients are attended by homeopaths and unqualified physicians who belong to the villages, efforts can be made to involve them in the ARI control programme.

Rational Drug Therapy of Acute Respiratory Infections in Children

- Lata Kumar*

Acute respiratory infections are amongst the leading causes for morbidity in children all over the world and is amongst the leading causes of death in children upto 5 years of age in the developing countries. The health burden of ARI is tremendous. Therefore it is not difficult to imagine the magnitude of drugs prescribed for this group of illnesses ranging from 'common cold' to potentially fatal pneumonia. Needless to say the amount of money spent to treat this group of illnesses is collosal. But are the drugs prescribed appropriate or rational? This question must be asked in every country, specially in a country like ours where a variety of health functionaries, qualified and unqualified, trained to different levels are involved in patient care and are prescribing medicines for ARI. Studies made on different categories of health functionaries showed that many medical doctors also were not prescribing rational drug therapy. There was rampant use of cold and cough medicines, and misuse of antipyretics and antibiotics. Major flaws in prescriptions were found on prescription audit in regard to treatment of common cold and sore throat and pneumonia. Unqualified health personnel like the registered medical practitioners (RMP) who still see sizable poor urban sick and the rural sick not only mistreat the upper respiratory infections but also their choice of antibiotics is not correct in many instances in regard to treatment of pneumonia in childhood, e.g., tetracycline is still being prescribed to treat pneumonia.

On the other hand, if the unqualified health personnel is well trained and continues to receive on the job training, their treatment practices become rational, cutting down very significantly

---

* Additional Professor, Department of Pediatrics, PGIMER, Chandigarh.

on unncessary use of drugs, thus avoiding unnecessary side effects. Needless to say the cost of ARI treatment is reduced greatly. The money thus saved can be put to use elsewhere.

The major points emerging from the above mentioned studies are:

(1) Continuing medical education is needed for all medical and non-medical health functionaries at all levels to inform them about rational management of ARI.

(2) PHC workers need to be trained in diagnosis and proper management of different ARI, especially pneumonia, as it is responsible for unacceptable mortality rate in our country, if any dent on ARI mortality is to be made.

(3) The registered medical practitioners or the RMP, who even today attract large numbers of rural sick and urban poor requiring medical care must be brought under the continuing medical education programme.

It is very important that education materials to be used to train health personnel must be appropriate to the personnel to be educated and that education should be updated from time to time if we want rational therapy of ARI in children on countrywide basis.

BRIEF OUTLINES OF RATIONAL DRUG THERAPY IN ARI IS GIVEN BELOW

Common Cold - Nasal or systemic decongestants, antihistamines, vasoconstrictors and antipyretics are available, mostly in combination. Their use has neither reduced the duration of illness or eased discomfort. On the other hand rhinitis medicamentosa (nasal drops), excitation, agitation, hallcinations

etc. are known to occur in children prescribed these cold and cough remedies. Antipyretics are perhaps the most abused. Attempts to reduce fever should be made only if temperature is more than 39^0C. Removing excess clothing and giving extra fluids is helpful in children with fever.

Otitis Media (OM) - This is a very common condition. The general concensus is to treat OM with antibiotics. The rational choice of antibiotics is based on causative organisms, the concentration of drug achieved in middle ear and safety of drug. Amoxycillin or ampicillin or trimethoprim sulfamethoxazole are given for 10 days but 10 day therapy for 1-year-old child using trimethoprim sulfamethoxazole cost about Rs. 13 as against Rs. 30-36 for amoxycill and Rs. 40-80 for Ampicillin.

Acute Sinusitis - The condition is usually underdiagnosed. Drug therapy reduces orbital and intracranial complications. The recommended antibiotics are amoxycillin, TM-Sz for 10-14 days as the causal agents are the same as for otitis media.

Sore Throat - Though the most common cause of sore throat is viral infection, clinical differentiation between viral and bacterial sore throat is extremely difficult. If a decision is taken to use antibiotics, penicillin remains the drug of choice. Unfortunately, our study has shown that it is used infrequently by various catagories of training personnel and that, too, for inappropriate duration. Re-education in proper use of Penicillin is required if we are to reduce the serious complications of strep sore throat. Oral penicillin for 10 days is recommended. In case compliance is suspect or patient is not able to make repeated contacts, single injection of long acting penicillin can be given.

Diphtheria - All attempts should be made to prevent diphtheria by achieving good immunization coverage. Diphtheria antitoxin is the only specific treatment if diphtheria is detected. Penicillin or erythromycin are used in addition, to eradicate the organism from oropharynx.

Group Syndrome - (A) Acute epiglotitis: It is caused by H. influenzae. It is seen infrequently in our experience. Chloramphenicol or ampicillin are the drugs of choice (7-10 days). Such cases must be referred to a health facility where nasotrachea intubation or tracheostomy is possible and facilities of I.V. fluid and I.V. drug administration and oxygen therapy are available.

(B) Laryngotrachitis: It iscaused by viruses. Inhalation of humid air is good for mild to moderate cases but if symptoms of inspiratory obstruction increase, aerosolized vasocontrictor like adrenalin should be used.

A single dose of 1 to 1.5mg/kg bod wt. of dexamethasone does no harm and may benefit the patient. This is also uncommon condition.

Bacterial Trachitis - The organism generally responsible is staphylococcus aureus. Children, present as group, are very sick and laryngoscopy reveals pus pouring out of trachea Antistaphylococcal antibiotics like cloxicillin plus gentamycin must be administered parentrally for 10-14 days.

Bronchiolitis - Common lower respiratory infection seen between 2 mo - 2 years of age, viral in nature. No antibiotics are required. Treatment is supportive. Almost all children with significant illness need oxygen. It should be given by face mask, nasal prongs or head box. The flow should be 2-3 litres per minut to prevent Co_2 accumulation. I.V. fluids are required during the phase of respiratory distress.

Antibiotics may be considered only if an afebrile child or mildly febrile child develops high grade fever or deteriorates suddenly as this may be the result of secondary bacterial infection Assisted ventilation is required for seriously sick patients.

Pertussis - It is immunization preventable disease. If pertussis occurs, its spread can be prevented by using effective antimicrobials in catarrhal phase and as prophylatic agent in exposed susceptible individuals. Erythromycin estolate is the drug of choice, duration of treatment is 14 days.

Pneumonia - Most pneumonia occurring in the developing countries is bacterial in nature thus relatively severe in nature but amenable to anti-microbial therapy. Rational drug use has brought down deaths in bacterial pneumonia to only a small number in the developed countries. Early recognition of pneumonia and its treatment in primary health care setting has also shown significant reduction in pneumonia deaths in studies conducted in many developing countries. Thus it is feasible to reduce ARI mortality significantly in these countries if training to PHC workers is given on continuing basis in recognition, treatment and referral of cases of pneumonia (where indicated) to appropriat health facility and educating public regarding immunizations. Education of the mothers in giving food and fluid to mild ARI cases, especially in seeking immunizations, and if her child develops signs and symptoms of moderate to severe pneumonia, to get medical help for her child without delay.

Most pneumonia is caused by pneumococci and Staph aureus an to a lesser extent by other organism (data obtained from children suffering from pneumonia at or soon after admission to the hospital). Thus procaine penicillin (7-10 days) is the drug of choice for most pneumonia at PHC level. Where facility of injections is not available an oral drug may be used as an

alternate. Trimathoprim sulfamethaxazole is preferred because it is effective against pneumococcus, H. influenzae and Staph aureus. In addition, it is cheap, can be given orally on twice a day basis. Amoxycillin, though more expensive, can also be used in young infants who should then be referred to health facility where intravenous drugs, fluids and oxygen therapy are available. All severe ARI, no matter what the age, must be referred to a good hospital facility.

In hospital setting where investigative facilities are available the antibiotics started on presumptive diagnosis e.g. penicillin for suspected pneumococcal pneumonia can be changed to Cloracillin and gentamicin (3-4 weeks) if course of illness or investigations. favour staphylococcal infection or to chloramphenicol or ampicillin for H. influenzae infection (7-10 days) Complicated pneumonias like these developing empyema or pyopneumothorax, need tube drainage under water seal.

Fluids, food and oxygen therapy (if required) must be given in appropriate amounts to these patients.

REFERENCES

1. Singh S and Kumar L. Inadequacies in management of acute respiratory infections.

2. Singh S. A comparative analysis of the treatment practices being followed in management of Acute respiratory infections. MD Thesis, Punjab University, 1985.

3. Singh S, Kumar L and Kumar V. Prescribing practices in childhood sore throat. Indian Pediatrics 1988: 25; 1149-1154.

4. Kumar V, Kumar L, Mand M etal. Child care practices in manageme of acute respiratory infections. Indian Pediatrics 1984; 21: 15-20.

5. Kumar L. Choice of antibiotics in acute respiratory infections in children. Ped Clinics of India 22: 83-90.

6. Kumar L and Deshpande S. Rational Drug Treatment of Acute Respiratory Infections. WHO Workshop on Rational Drug Therapy, AIIMS, New Delhi, 1987.

A Study of Morbidity and Mortality amongst Pre-school Children in 12 Anganwadis of Surat Project

- Y. Manihar Singh
- D.M. Saxena*

Introduction

"Health" cannot be achieved where poverty and misery abound, where food and safe water are scarce, where housing is inadequate, and where public and community services are lacking or rudimentary. In such conditions faced by two-thirds of the world's population, ill health and premature deaths are the rule of the day. Most severely affected by such environmental risk factors are the child bearing women and children themselves. Because of their special vulnerability they pay a heavy price in terms of death, morbidity, retarded growth and disability WHO (1979). The present study was carried out to study morbidity and mortality in pre-school children.

Material and Methods

At the time of study 100 Anganwadis were operational in Surat City. It was decided to select anganwadis from each geographical area of the city so that all migrant groups could be represented in the study. Accordingly, all Anganwadis were grouped according to election wards, and from each ward one anganwadi was selected by random method. These selected anganwadi centres had 11063 population which was 12.3 per cent of the total population covered by the urban project.

A population of 9633 was actually covered by a house-to-house survey. Out of the total 1873 pre-school children residing in these anganwadi areas, 1719 preschool children were actually examined. Current morbidities which had taken place in the last 15 days of the survey were noted, while deaths within last one year (Diwali to Diwali) were noted with their most probable causes.

---

* Professor & Head, Deptt. of Preventive & Social Medicine, Medical College, Surat.

Observation

Of the 1719 children examined, 480 (27.9%) children had one or other type of illness during the last 15 days from the date of survey. The total illnesses recorded were 638. The overall prevalence of illnesses (episodes) was 37.1 per cent. There were 1.33 illnesses per sick child and 9.03 illnesses per child year (Table 1).

In 867 beneficiary children, 233 (26.9%) children had suffered from one or other type of illness. Total illnesses observed during this period were 296, giving a prevalence of illnesses (episodes) as 34.1 per cent. The number of illnesses per sick child were 1.27 during this period, which worked out to 8.31 illnesses per child year (Table 1).

In the non-beneficiary group of children, out of the total 852 children 247 had suffered from one or other type of illness during this period, thus giving a prevalence rate of 29.0 per cent. Total illnesses observed in these children were 342, giving a prevalence of illness (episodes) of 40.1 per cent. The number of illnesses per sick child during this period were 1.38, which worked out to 9.77 illnesses per child year (Table 1).

The difference between child morbidity rate in beneficiary and non-beneficiary group was statistically not significant. However the difference in the prevalence of illnesses (episodes) was statistically significant ($Z=2.5$, $P<0.05$) indicating that the number of episodes of illnesses was higher in the non-beneficiary group as compared to the beneficiary group.

Table 1

Morbidity Pattern

S.No.		Beneficiary group	Non-beneficiary group	Total
1.	Children	867	852	1179
2.	No affected	233	247	30
3.	No of Episodes	296	342	638
4.	Episodes per sick child	1.27	1.38	1.33
5.	Episodes per child year	8.31	9.77	9.03
6.	Prevalence(%) (Episodes)	34.1	40.1	37.1
7.	Prevalence(%)	26.9	29.0	27.9

Table 2

Common Morbidities

S.No.	Disease	Beneficiary group (867)	Non-Beneficiary group (852)	Total (1719)
1.	Pyrexia U.O.	58 (6.7)	71 (8.3)	129 (7.5)
2.	Pyoderma	55 (6.3)	46 (5.4)	101 (5.9)
3.	Diarrhoea	31 (3.6)	25 (2.9)	56 (3.3)
4.	ARI	30 (3.5)	25 (2.9)	55 (3.2)
5.	Vit. 'A' Def.	23 (2.7)	31 (3.6)	54 (3.1)
6.	Anaemia	21 (2.4)	24 (2.8)	45 (2.6)
7.	Marasmus	19 (2.2)	30 (3.5)	49 (2.8)
8.	Conjuctivitis	15 (1.7)	13 (1.5)	28 (1.6)
9.	Otorrhoea	69 (0.7)	15 (1.8)	21 (1.2)
10.	Helminthiasis	8 (0.9)	12 (1.2)	20 (1.2)
		266	292	558
Proportion to total illness (%)		89.9	85.4	87.5

Table 2 showed the 10 most common illnesses observed in pre-school children during the last 15 days from the date of survey; 3 were nutritional and 7 were infective in orgin.

It was observed that pyrexia of unknown origin was the most common illness with a prevalence rate of 7.3 per cent which was followed by Pyoderma (5.9%) Diarrhoea (3.3%) Acute Respiratory Infection (3.2%), Vit. A deficiency (3.1%), Marasmus (2.8%), Anaemia (2.6%), Conjuctivities (1.6%), intestinal helminthiasis (1.2%) and Otorrhoea (1.2%) All other illnesses had less than 1 per cent prevalence.

The difference in the prevalence of the above 10 illnesses between beneficiary and non-beneficiary group of children was statistically not significant (Table 2).

However, nutritional disorders were more common in the non-beneficiary group of children though the difference was statistically not significant. Among illnesses of infective origin, ARI, Diarrhoea, Pyoderima and Conjunctivities were more in the beneficiary group of children, while Pyrexia, Helminthiasis and Otorrhoea were more common in the non-beneficiary group, though differences were not statistically significant (Table 2).

These 10 most common diseases contributed to 87.5 per cent of total illnesses observed, while in the beneficiary group and non-beneficiary group this proportion was 89.9 per cent and 85.4 per cent respectively.

The seven diseases of infectious origin contributed to 64.3 per cent, 68.6 per cent and 60.5 per cent respectively in overall, beneficiary and non-beneficiary groups of children. Acute respiratory infections contributed to 8.6 per cent of the total illnesses. In the beneficiary group this proportion was 10.5 per cent while in the non-beneficiary group it was 7.3 per cent.

Agewise distribution showed that the prevalence of diseases of infectious origin was significantly higher in less than 3 years age group when compared with more than 3 years age group, in the overall group ($p < 0.01$) and the beneficiary group ($p < 0.01$), but in the non-beneficiary group this difference was not statistically significant, though the prevalence was higher in less than 3 years age group. On the other hand nutritional disorders in general were more common in the more than 3 years age group though differences were not statistically significant (Table 3).

In the beneficiary group prevalence of Pyrexia, Pyoderma, Diarrhoea, Acute Respiratory Tract Infection, Marasmus Anaemia and Helminthiasis were comparatively higher in less than 3 years age group, while Vit. 'A' deficiency, conjunctivitis and otorrhoea were more in the more than 3 years age group. Pyrexia, Diarrhoea, Marasmus, and Helminthiasis were more in the less than 3 years age group while pyoderma , ARI, Vit. A deficiency, Anaemia and Otorrhoea were more in the more than 3 years age group.

Table 4 showed agewise distribution of mortality in the preceeding one year according to their causes. During this period a total of 80 deaths were reported. In the surveyed population various mortality rates calculated are shown in Table 5.

The crude death rate was 8.3 per 1000 population; 50 per ce of these deaths took place in the 0-6 years age group. The majority of these deaths were preventable.

The 0-7 days mortality rate was 16.9/1000 live births. All the deaths in t is group were sudden deaths. The neonatal mortality rate was 25.4/1000 live births. In this age group also the majority were sudden deaths and 1 was due to Pneumonia. The post neo-natal mortality rate was 33.9/1000 live births. The most common of deaths in this group was Pneumonia, and the second most common cause was Diarrhoea. I.M.R. was 59.3/1000 live birth. The pre-school mortality rate (1-6 yrs.) was 11.2/1000 children (1-6 yrs.); most common cause of deaths were Pneumonia, Pyrexia, Measles, and Diarrhoea.

In all the age groups pneumonia was the leading cause of death, followed by sudden infant death, old age Pyrexia, Tuberculosis, Diarrhoea, Coma and others (Table 4)

In the 0-6 years age group Pneumonia was the leading cause of death (27.5%) followed by sudden infant death (20%), Diarrhoea (12.5%), Pyrexia (12.5) Measles (75) PEM (7.5) Encephalitis (5.0) and others (7.5).

Discussion

Morbidity rates and the sickness/child year observed in the present study were comparable to other studies carried out in ICDS blocks (Krishnamurthy and Nadkarni, 1983, Tarun Kumar et al 1985; Khanolkar et al 1985). The higher overall morbidity rates and the No. of sickness/child year were observed in the non-beneficiary group of children indicating the impact of ICDS scheme similarly observed by others (selected Research Abstract on ICDS 1986).

Similar causes of morbidity were also reported by many workers (loccit, and Summary Reports on baseline and repeat surveys on ICDS in experimental projects AIIMS, New Delhi).

In the present study various mortality indicators were lower than the national average. This has been reported from many ICDS blocks in the country from time to time (Research Abstracts on ICDS 1986) This shows the impact of ICDS scheme.

Similar causes of deaths were also reported from many ICDS blocks both in urban and rural areas (Selected Research Abstract on ICDS, 1986).

Bibliography

1. WHO (1979 : WHO Chronicle 33(12) page 433-480, 1979.

2. Krishnamurthy, K.G., Nadkarni, M.V : ICDS an assessment UNICEF 1983, New Delhi.

3. Tarun Kumar, Sunder Lal and Vasudeva Y.L. (1985) : An epidemiological study of nutritional status, morbidity, and mortality in children below the age of six years with special emphasis on PEM in urban slums of Rohtak City; Research abstracts on ICDS page 79-80 (1986).

4. Khanolkar, V., Vasudeo, N.D., Ingole, D.L., Majumdar R.D., (1986) A longitudinal study on morbidity pattern in the age group of 0-5 years in urban slums of Nagpur; Ibid page 194-196.

5. Selected Research Abstract on ICDS 1986 AIIMS, New Delhi.

6. Summary reports on base line and repeat surveys on ICDS in experimental projects AIIMS, New Delhi.

Table 3

Agewise Distribution of Morbidities

S.No.	Disease	Beneficiary		Non-beneficiary	
		/3 yrs(311)	/3 yrs(556)	/_3yrs(419)	/_3 yrs (433)
1.	Pyrexia U O	28(9.0)	30(5.4)	45(10.7)	26(6.0)
2.	Pyoderma	26(8.4)	29(5.2)	22(5.3)	24(5.5)
3.	Diarrhoea	19(6.1)	12(2.2)	21(5.8)	4(0.9)
4.	ARI	14(4.5)	16(2.9)	9(2.1)	16(3.7)
5.	Vit 'A' Def.	4(1.3)	19(3.4)	10(2.4)	21(4.8)
6.	Anaemia	10(3.2)	11(2.0)	10(2.4)	14(3.2)
7.	Marasmus	12(3.9)	7(1.3)	22(5.3)	8(1.8)
8.	Conjunctivitis	2(0.6)	13(2.3)	5(1.2)	8(1.8)
9.	Otorrhoea	1(0.3)	5(0.9)	5(1.2)	10(2.3)
10.	Helminthiasis	3(1.0)	5(0.9)	7(1.7)	5(1.2)

Table 4

Agewise Causes of Mortality

Name of Disease	Age Group					Total
	0-7 days	8-28 days	29 days to 1 yr.	1-5 yr	6 yrs	
Pneumonia		1	4	6	-	11
Sudden Infant Death	6	2	-	-	-	8
Old Age	-	-	-	-	8	8
Pyrexia	-	-	1	4	2	7
Pulm. Tuberculosis	-	-	-	-	7	7
Gastro-enteritis	-	-	3	2	1	6
Coma	-	-	-	-	6	6
Encephalitis	-	-	1	1	2	4
Measles	-	-	-	3	-	3
Inf. Hepatitis	-	-	-	1	2	3
P.E.M.	-	-	2	1	-	3
Accident	-	-	-	-	3	3
Injury (Bullet)	-	-	-	-	3	3
Chr. Illness	-	-	-	-	3	3
Post. Operative Complications	-	-	-	1	1	2
Leukemia	-	-	1	-	-	1
Complicated Labour	-	-	-	-	-	1
Diabetes	-	-	-	-	1	1
Total	6	3	12	19	40	80

Table 5

Important Mortality Rates Observed

1)	Crude Death Rate	-	8.3/1000 Popn.
2)	Proportional Mortality Ratio (0-5 yrs.)	-	50%
3)	0-7 Days Mortality Rate	-	25.4/1000 Live Births
4)	Neo-natal Mortality Rate	-	25.4/1000 Live Births
5)	Post-neo-natal Mortality Rate	-	33.9/1000 Live Births
6)	Infant Mortality Rate	-	59.3/1000 Live Births
7)	Pre-school Mortality Rate	-	11.2/1000 1-5 yrs children

Utilization of Anganwadi Workers in Surveillance of Acute Respiratory Infections

- P.L. Joshi*
- M. Bhattacharya
- B. Raj

Introduction

In India 50 per cent of all deaths occur amongst children under 5 years of age and Acute Respiratory Infections (A.R.I.) account for nearly 20-25 per cent of deaths in this age group. On an average, these children in the urban areas suffer from 5-7 episodes of A.R.I. annually, lasting 7-9 days.(1) Repeated exposures may lead to malnutrition. Besides being a continuous health hazard, this infection cause a serious strain on the limited infrastructure for paediatric care in the country where 20-35 per cent of all consultations in the clinics and 25 per cent of paediatric hospital admissions comprise cases with acute respiratory tract infections. A few reports 2,3, have come through indicating that given an adequate training paramedic personnel and even mothers can be helpful in recognising the severe symptoms early and initiate timely treatment. As an infrastructure of anganwadis was already present in the urban slums of our city, the present study was conducted with the objective of assessing the feasibility of utilizing the anganwadi workers at the community level, after training, to identify the cases of A.R.I. in children, to give antibiotic to the moderate cases and to refer the serious cases to the hospital.

Material and Method

The study was carried out in the urban slums of Allahabad through 12 anganwadi centres which had been randomly selected from the total of 100 Anganwadi Centres. The study was initiated in November 1988 and continuing till date. The data

* Reader, Deptt. of Social & Preventive Medicine, MLN Medical College, Allahabad.

presented in this study relates to the study period between November 1988 to June 1989. The 12 anganwadi workers were trained for two days initially and then one day every month about the identification of the A.R.I. cases and their management according to the guidelines laid down by W.H.O.. A child with cough and a breathing rate of 50 or less and feeding normally was categorized as a mild case. A child with cough, rapid breathing more than 50/mt. and feeding normally was labelled moderate, while the presence of cough, rapid breathing, chest insuction and inability to drink indicated that the child was severe. The Anganwadi Workers were instructed to give cotrimoxazole to the needy mild and moderate cases and refer the severe cases to the hospital. The workers were also told to educate the mothers about the signs and symptoms of A.R.I. and to ask them to report immediately to the anganwadi if the child became serious. The community in the areas of these anganwadi were informed that the medicine for moderate cases was available at the centre. A census of the area covered by the 12 anganwadis was carried out to enumerate the number of children under five years of age and to educate the mothers. All births and death in the under-fives during this period were registered. The questionnaire was drafted in Hindi and the Anganwadi Worker collected information about the cases when the (1) child attended the anganwadi , (2) the child/parents came to ask for medicines or advice, (3) by visiting the affected households when she was informed about them by the dai or by any other person. The dai visited the households daily to collect children for the anganwadi and hence informed the AWWs about the serious cases and if any one was taken to the hospital or to a doctor.

The investigators made fortnightly visits to the anganwadis. There they collected information about the cases that occurred during the forthnight. All deaths, serious and moderate cases reported by the AWWs were confirmed by visiting the households.

Results

A total of 1458 families in 12 anganwadis with 1569 pre-school children were studied. Out of the total children (790) 50.6 per cent were males and 49.4 per cent females. Eighty-nine per cent were Hindus and the rest Muslims. Amongst theHindus (704) 50.6 per cent were scheduled caste, 28. 1 per cent backward and the rest belonged to upper castes.

Age and Sexwise Attack rate - It can be observed from Table 1 that 53 per cent of the children had suffered from A.R.I. during the study period. The attack rate declined with the increase in age, since the rate was 85.3 per cent in infants but decreased to 34.6 per cent by the age of 5 years. This association with age was found to be statistically significant - P /.05. The attack rate was noted to be significantly distributed (P/.05) amongst the sexes as more males (55.9%) suffered than the females (49.6%). The average number of episodes per child was observed to be 1.4 with an average duration of 5.2. The average number of episodes 1.7 and the duration 6.1 days were the maximum figures observed in the age group between 1-2 years The episodes, however, gradually declined to 1.1 but not much change was observed in regard to duration which came down to 5 days (table 2).

Seasonal Distribution: Out of the total of 1165 episodes more than 75 per cent occurred in the winter months of November, December, January and February and then there was a decrease to 19.6 per cent in April and May and 1.3 per cent in May and June (Table 3).

Symptomatology: Cough was reported in all episodes of A.R.I., followed by running of nose (63.3%) and fever (50.2%) rapid breathing (11.1%), chest insuction (3.4%) and difficulty to drink in (1.7%) (Table 3). The average number of symptoms per child was 2.3. The severity of the symptoms such as chest insuction and difficulty to drink was maximum in the age group 1-2 year the figures being 6.1 and 5.2 respectively. The symptom of difficulty in drinking was not observed after the age of three years and was the least in infants (0.6%). Rapid breathing was noted to be most frequent in the age group of 5 years (18.5%) followed by the 2 year olds, (13.6%). Fever was found to occur more frequently above the age of 3 years present in more than 50 per cent of the cases.

Immunization Status and A.R.I. episodes: Out of the total 298 children amongst the fully vaccinated group 83 per cent had experienced only one attack of A.R.I. and only 7 per cent had endured three episodes. However, in the partially and the non-vaccinated group more children suffered from 293 episodes of A.R.I., the average figures being 21.5 per cent and 13.4 per cent respectively. The association between the vaccination status and the number of episodes was observed to be statistically significant. ($P < .001$). Table

Source of Treatment: Out of the total 1165 episodes, treatment was sought in 971 episodes (83.3%) and no treatment in 194 or (16.4%) Table 5. Home remedial measures had been commonly employed for the children in 39.4 per cent of the episodes and a majority of the children recovered with those treatment. Home remedial measures had been mainly herbal tea and other decoctions using Tulsi leaves, warm oil and pepper massage after adding some spice, garlic or camphor, and leaving out cold foods from the diet. When the children did not

improve in 34.8 per cent of the episodes the parents consulted the AWWs and she gave the medicine cotrimoxazole to the children in 11 per cent of the episodes in which the children showed the symptom of rapid breathing of more than 50/min. In forty-eight episodes (4.9%), the children were referred to the hospital by the A.W.Ws. which included all cases of chest insuction, inability to drink and few children with rapid breathing. In about 24.7 per cent of the episodes, the parents were not satisfied with the A.W.W.s. and went to show their children to private practitioner. There were 11 deaths (1.3%) from the total number of 834 children Ninety per cent of the deaths occurred because the treatment were initiated late.

Discussion: Planning and organisation of the National ARI control programme through ICDS would be a model of scientific and enduring basis. As a routine AWWs are supposed to report deaths by age and cause. Monitoring of the children with A.R.I., and appropriate management and referral of serious cases to health facilities can be achieved through these primary health care workers by regular reorientation training and adequate logistic support, as was evident in our study and has been reported by others 2,3. A total of 1165 episodes were reported by the anganwadis for 834 children. The incidence was maximum at 83.3 per cent in the first year of life declining to 34.6 per cent in children of 5-6 years. Similar pattern has been reported by authors of other urban based studies 3-4. Males were affected more 55.9 per cent compared to 49.4 per cent females and the association was significant P$<$.05. Narain and Banerjee[4] have also reported a male female ratio of 1.7:1 and the cause in both the studies can be attributed to preferential treatment to male children who when sick are more likely to be brought to a health care facility[4]. Out of the total episodes of A.R.I., in 11.1 per cent, the children developed rapid breathing and chest insuction occurred in 3.4 per cent of the episodes. (Table 3). These figures are slightly less than the figure of 10-15 per cent reported by other studies[4], for

moderate to severe cases. The average number of episodes per child was observed to be 1.4 with an average duration of 5.2 days. Other studies have stated the figures of 5-8 episodes/child/year Figures noted in our study may be attributed to incomplete reporting by the AWWs since the surveillance was conducted passively However, the situation can improve by creating better awareness and motivation of the community members towards the AWWs and the programme as a whole. Such efforts will also decrease the number of parents consulting the private practitioners unnecessarily, on even for mild and moderate cases of A.R.I., as observed in our study where 25 per cent of the episodes had been treated by the local practitioners. Inspite of the shortcomings the AWWs gave medicines to children in 11 per cent of the episodes and referred the children to the hospital in 48 episodes. Thus early management helped to bring down the mortality in our study to 1.3 per cent a fact supported by other workers too.

To sum up, the study confirms the findings of the various studies that primary level workers can help to implement the A.R.I. control programme successfully provided that the AWWs are adequately trained and are given enough drug supplies and their performance is regularly monitored. On the other hand the community needs to the mobilised for effective utilization of the services.

References

1. Vishwa Karma G.K. : National Workshop on A.R.I. control Programme held at Khajuraho, M.P. 3-6 Sept. 1987.

2. Kumar V, Datta N. Kumar L. : Experiences in the implementation of A.R.I. control activities as part of primary health care. Technical Advisory group on A.R.I. second metting geneva W.H.O. (TRI/ARI TAG II/ 85.14.

3. A.R.I. News Issue No. 3 December, 1985.

4. Acute Respiratory Infection: Epidemiology and control. National Institute of Communicable Diseases, Delhi, 1988.

5. Mahendra Dutta, Sharma R.S. : Prospects of National A.R.I. control in India. Ind. J. Pediatric 54: 149-152, 1987.

Table 1

Age and Sexwise Distribution of ARI

Age in Years	Sex					
	Male		Female		Total	
	No.	Attacked	No.	Attacked	No.	Attacked
1	175 (22.1)	171 (91.1)	186 23.9)	137 (73.7)	361 (23.0)	308 (85.3)
2.	138 (17.5)	72 (52.2)	148 (19.0)	64 (43.2)	286 (18.2)	136 (47.5)
3.	147 (18.6)	70 (47.6)	148 (19.0)	89 (60.1)	295 (18.8)	159 (53.9)
4.	150 (19.0)	59 (39.3)	156 (20.0)	61 (39.1)	306 (19.6)	120 (39.2)
5.	180 (22.8)	70 (38.9)	141 (18.1)	41 (29.0)	321 (20.5)	111 (34.6)
Total	790 (50.6)	442 (55.9)	779 (49.6)	392 (50.32)	1569 (100.0)	834 (53.15)

$X^2 = 11.45$ df=4 $P < .05$

$Z = 5.58 : P < .05$

Table 2

ARI Cases by Episdoes and Duration

Age in years	Number attached	No. of episodes	Av. No. of episodes/child	Av. duration of episode/ child
1	308	462	1.3	4.7 days
2.	136	231	1.7	6.1 days
3	159	201	1.3	5.3 days
4	120	147	1.2	5.1 days
5	111	124	1.1	5.0 days
Total	834	1165	1.4	5.2 days

Table 3

ARI Episodes by Age and Presenting Symptoms

Age group years	No. Attacked	Cough	Running nose	fever	Rapid breathing	Chest insuction	Difficulty to drink	Total
1	308	462	247	216	42	9	3	979
2	136	23	228	101	31	14	12	617
3	159	20	152	122	17	5	5	502
4	120	147	45	63	16	8	-	279
5	111	124	65	79	23	4	-	295
Total	1569	1165 (100.0)	737 (63.3)	581 (50.2)	129 (11.1)	40 (3.4)	20 (1.7)	2672 (2.3)

Table 4

ARI Episodes by Immunization Status

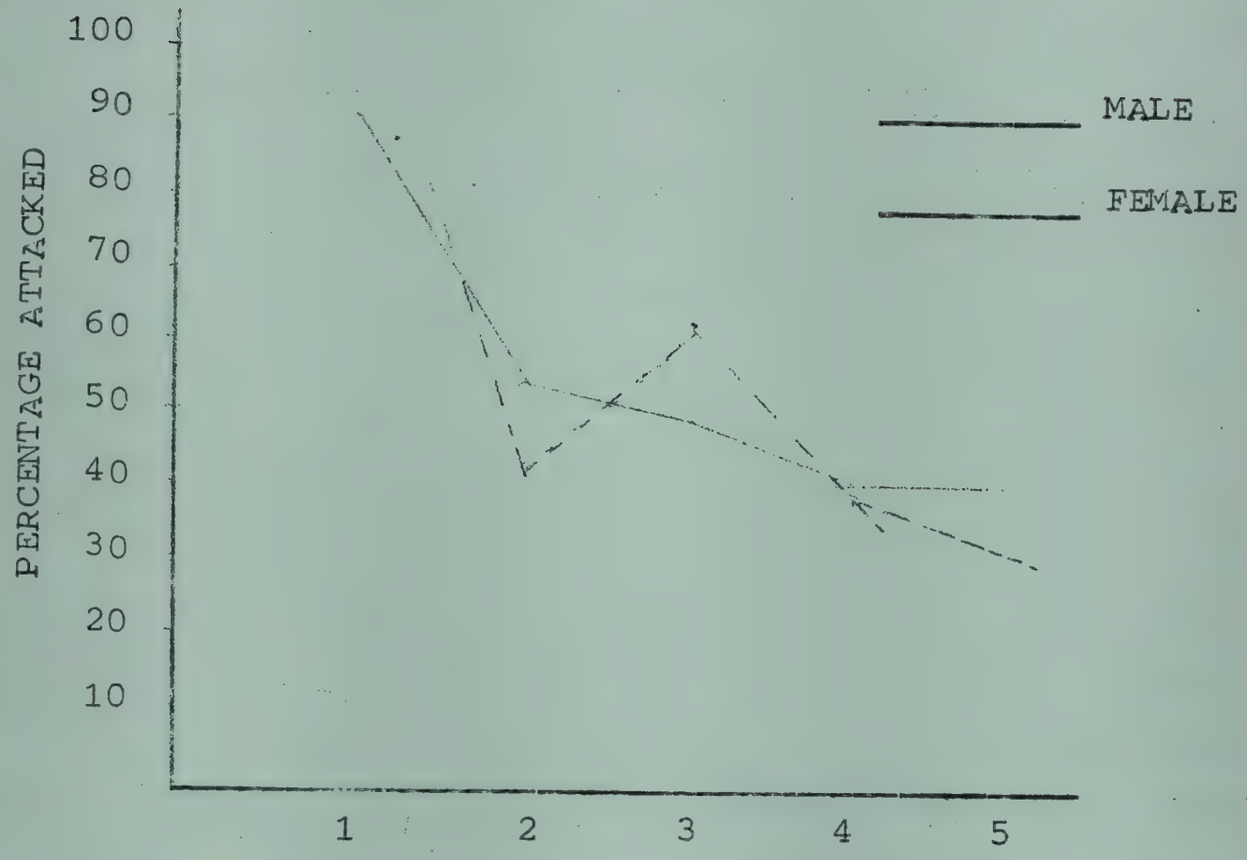
Immunization Status	No. of Episodes 1	2	3	Total
Fully Vaccinated	248 (83.2)	29 (9.7)	21 (7.0)	298 (100.0)
Partially Vaccinated	166 (66.7)	50 (20.1)	33 (13.2)	249 (100.0)
Not Vaccinated	182 (63.4)	66 (23.0)	39 (13.6)	287 (100.0)
Total	596 (71.5)	145 (17.4)	93 (11.1)	834 (100.0)

$x^2 = 32.50$ df=4 P/.001

Table 5

ARI Episodes by Source of Treatment

Source of Treatment	Number	Percent
Received	971	83.3
Home Remedy	387	39.4
Anganwadi Workers	383	34.8
Private Practitioner	240	24.7
Hospital	48	4.9
Homeopathic	13	1.3
Not Received	194	16.4



FITURE 1

AGE & SEXWISE CASES OF ARI IN PRE-SCHOOL CHILDREN

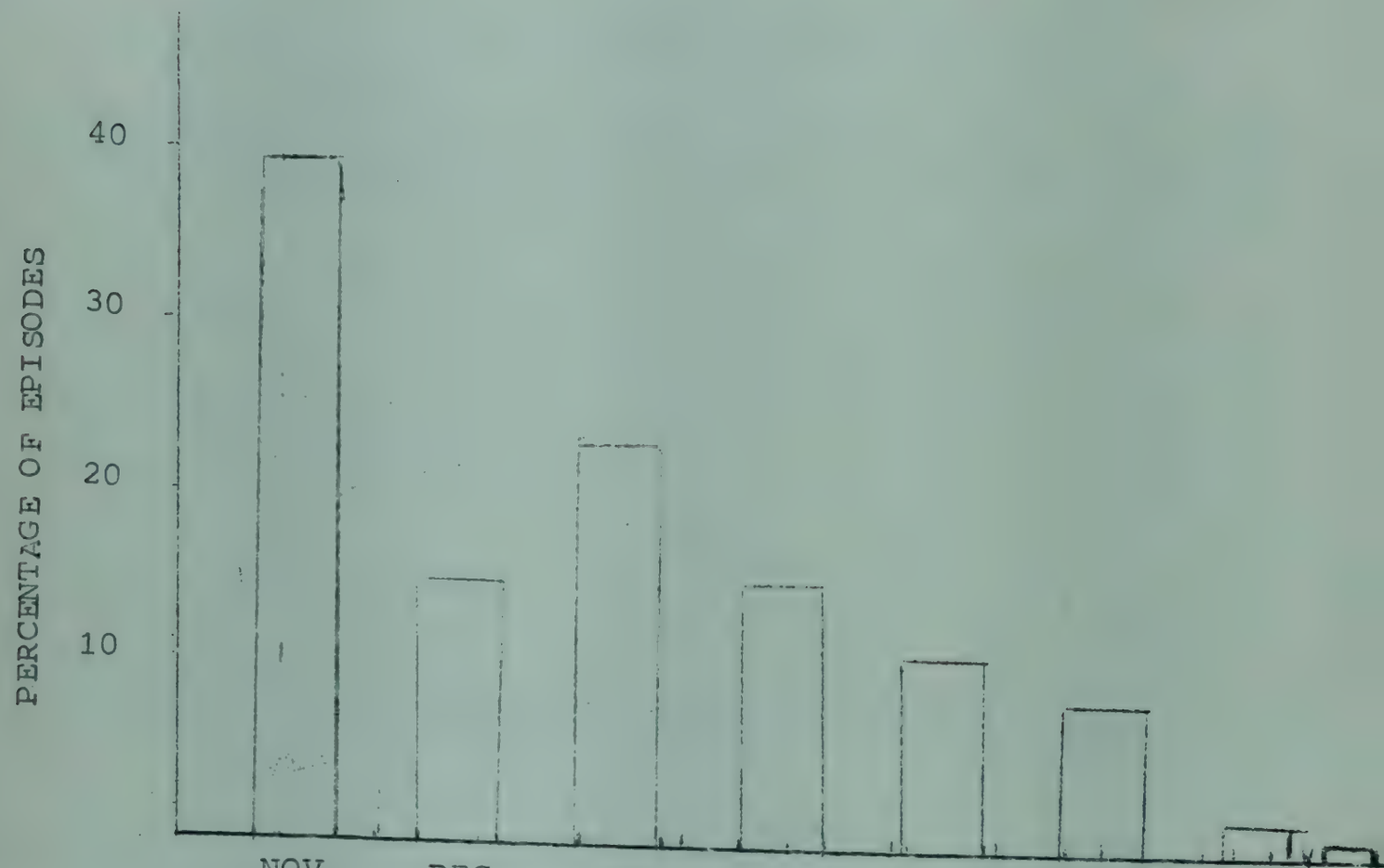


FIGURE 2

MONTHWISE DISTRIBUTION OF ARI EPISODES IN CHILDREN

SECTION V

ACUTE RESPIRATORY INFECTIONS

- A Background Paper

Acute Respiratory Infections

- Dinesh Paul*
- Umesh Kapil**

Acute respiratory infections are out of control. They represent a largely ignored challenge in the field of communicable diseases. Acute respiratory infections (ARI) can be defined as episode of acute symptoms and signs resulting from infection of any part of respiratory tract or any related structure including paranatal sinuses, middle ear and pleural cavity.

Mortality and Morbidity

ARI constitutes a complex and heterogenous group of illnesses with the three conditions i.e., bronchialitis acute laryngitis and pneumonia being primarily responsible for most of ARI related deaths among children below 5 years of age. In India, there were 3.3 million cases of ARI reported in 1983 as influenza, diphtheria, measlas and whooping cough. During 1983-84, 9.63 million ARI patients were seen as out-patients in hospitals and dispensaries of 14 states and union territories. Of non-specific ARI cases, 1.9% required hospitalization compared to 2.5% of influenza cases. Population based longitudinal studies involving active surveillance through forthnightly to monthly home visits indicate that a child in the urban areas, on an average, may suffer from 5-8 episodes of ARI per year, during the first 5 years of life. In the rural areas, the reportedlincidence per child is lower (1-3 episodes per year). The annual incidence of penumonia among children under five years is about 94 per 1000 children. ARI accounts for 14.3 per cent of deaths during infancy and 15.9 per cent of deaths between 1-5 years of age. In the pediatric age group

* Deputy Director (Health), NIPCCD.
** Assistant Professor, AIIMS.

20-24 per cent of deaths are reportedly attributable to acute respiratory infections. A similar pattern emerges from community based longitudinal studies which show that ARI accounts for 20-29 per cent of all deaths.

ARI most commonly occur in the first year of life, followed by the 1-4 years age group. In a longitudinal study in urban Delhi, the incidence was 81 per 1000 months during the first year of life and then decreased to 68, 67, 56 and 31 per 1000 months during the subsequent 4 years.

No reliable state-wise ARI morbidity and mortality data is available in the country. A study conducted in rural areas of Ballabgarh Block, Haryana (1988) reported that the morbidity due to ARI was 3.67 attacks/child/year. Proportional mortality rate due to ARI was 22.6% in under five children; 66.5% of deaths were in infants. The fatality rate was 1.31 per cent and ARI related mortality was 6.3/1000 children.

A longitudinal study conducted in a semi-urban area of Pondicherry (1986) showed that Upper Respiratory Infections and Lower Respiratory Infections accounted for 42 per cent and 9.3 per cent morbidity in the under-five children respectively.

Community based studies conducted by PGI, Chandigarh reported that ARI accounted for 3.47 attacks per child per year in under-three children. The attack rate was 2.2 per cent during the first year of life. In a survey carried out in children below five years (1984) and in another (1985) the point prevalence of Acute Lower Respiratory Infection was found to be 2.4 per cent and 7.2 per cent respectively. Several cohort studies and those based on routine reporting of births and deaths carried out by PGI have indicated that ARI

Severe respiratory infections, especially pneumonia, contribute to 20-25% of all deaths in children with an estimated 600,000 deaths per year in India. In addition to high mortality ARI leads to significant disability in the form of chronic respiratory diseases, deafness, malnutrition and cardiac diseases. The burden of ARI illnesses is a considerable strain on the health facilities of the country. Respiratory infections tend to be reported more frequently among males than females. The male to female ratio is about 1.7 to 1. The difference may be due to preferential treatment to male children who when sick are more likely to be brought to hospital or a health care facility. ARI is twice or three times as common in winter as in summer. The following table depicts the percentage distribution of deaths among children less than 1 year and 1-4 years of age due to respiratory infections.

Table 1

Percentage distribution of deaths due to respiratory infections in India(rural) from 1981 to 1986.

Causes	1 year						1-4 year					
	81	82	83	84	85	86	81	82	83	84	85	86
Asthma & Bronchitis	1.2	2.1	2.0	1.9	2.5	1.8	3.4	1.9	2.7	2.3	3.0	2.7
T.B. of Lungs	0.3	0.4	0.2	0.3	0.3	0.3	1.4	1.0	1.6	1.5	1.5	1.4
Pneumonia	43.7	45.2	44.3	43.7	43.8	47.0	30.0	29.1	28.8	33.1	31.6	28.0

Source : India, Office of the Registrar General, Survey of Causes of Death(rural) 1981-86.

Vaccine Preventable ARI

These include measles, diphtheria, whooping cough, childhood tuberculosis and pneumococcal infections. The following table depicts the annual incidence of measles, diphtheria, whooping cough and tuberculosis from 1974 to 1987.

Table 2

	Measles	Diphtheria	Pertussis	Tuberoculosis
1974	119714	26912	243288	532692
1975	133561	34269	345527	675508
1976	157057	17813	373814	589768
1977	124888	20596	303886	610531
1978	172177	22305	446431	668794
1979	143358	31346	335241	662600
1980	124031	34241	320110	657469
1981	197129	21130	359290	766974
1982	146796	21469	277848	841917
1983	129639	11713	211282	881328
1984	190881	13111	189287	987013
1985	151332	11936	184368	903917
1986	116333	5246	124585	727149
1987	170602	7002	95919	692253
Immunization coverage of infant as on Jan'89	44%	73%	73%	72%

Source : WHO/EPI/GEN/88.9 SEA July 1988

Table 3

Estimated annual number of cases and deaths presented from pertussis and measles

	1987 New borns (000's)	Surviving Infants (000's)	Prevented Pertusis cases (000's)	Prevented Pertussis deaths (000's)	Prevented measles cases (000's)	Prevented measles deaths (000's)
India	24758	22133	9190	103	3575	107

It can be seen from the table that vaccine preventable ARIs are decreasing because of better immunization coverage.

Data on pneumococcal infections in India are not available. A disease of continuing endemicity, it primarily affects infants and elderly persons. Case fatality in the Western countries has been reduced to 5 to 10% among hospitalized persons with antibiotics. Vaccine against pneumococcal infection is not currently available in India.

Classification of ARI

The acute respiratory infections (ARI) can be classified based on etiology, anatomical involvement, site of involvement and most importantly, on important signs and symptoms that can be used for making management decisions. ARI classification, therefore, can be based on the following:

1. Etiological
   Viral
   Bacterial
   Fungal
   Mycoplasma
   Allergic

CH135 N87
05786
COMMUNITY HEALTH CELL LIBRARY AND DOCUMENTATION UNIT

2. Anatomical

Rhinitis	Laryngitis
Sinusitis	Tracheitis
Otitis media	Bronchitis
Pharyngitis-tonsilitis-quinsy	Bronchiolitis
Epiglotitis	Pneumonia (lobar, bronchial or interstitial)

3. Site of involvement

Upper : URI, Pharyngitis(coryza, cough, sore throat)

Mild : Epiglotitis, laryngotracheo bronchitis (croup, stridor, hoarseness, retractions)

Lower : Bronchiolitis, pneumonia (tachypnoea, wheeze, rales, nasal flaring, retractions)

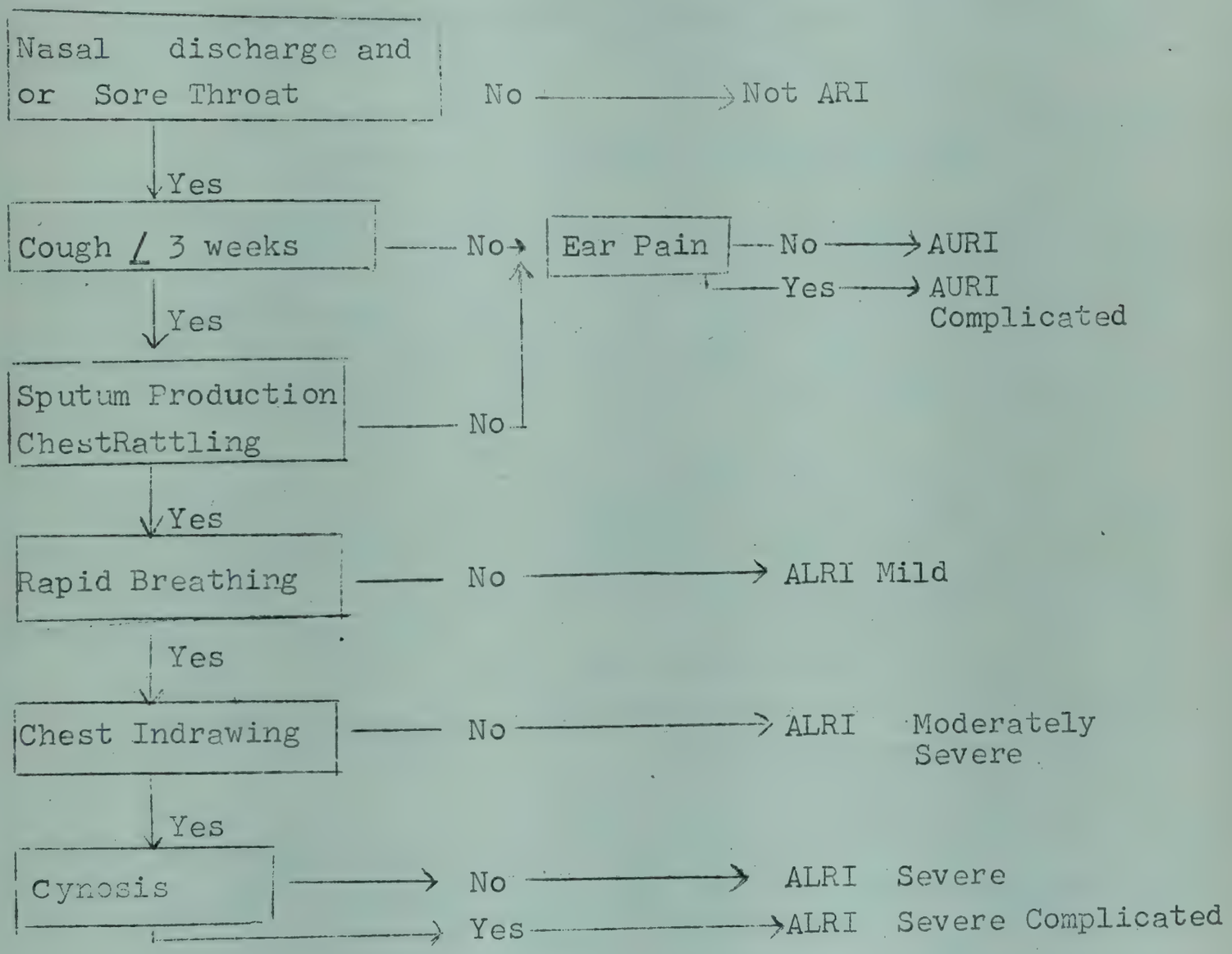
4. Management Oriented

Severe : (Unable to feed, Retractions) Refer
(Resp. rate 70+stridor)

Moderate Resp. rate 50+ Home Care with antibiotics

Mild : Cough
Resp. rate below 50
Stridor without retractions Supportive measures only

Simplified Decision Tree for ARI



ARI Control Programme

The ARI-CP should have three essential components:

1. Standard case management
2. Vaccination against common childhood diseases.
3. Health Education.

Standard Case Management

This should be based on management oriented criteria using three simple clinical manifestations, which will categoris ARI in mild, moderate and severe. These manifestations are (i) rapid breathing, (rate more than 50 per minute, (ii) chest indrawing (recession of ribs) and (iii) inability to drink.

If a child with ARI has any of these symptoms, he may have moderate or severe ARI and requires antimicrobial therapy. If chest indrawing is present referral or admission to hospital or health centre is necessary. These signs can easily be recognised by a mother or a PHC worker, who based on these signs, will determine which child requires antibiotics and which requires referral or hospitalisation.

A child with moderate ARI (cough and rapid breathing but the chest indrawing) will require antimicrobial therapy in the form of oral cotrimoxazole (4 mg/kg, 12 hourly for five days) or ampicillin or pencillin (oral or parenteral) and supportive measures at home. A case of severe ARI (cough and chest indrawing or cough and not able to drink) needs immediate refferal to a health centre or a hospital.

A child with mild ARI (cough but no rapid breathing or chest indrawing) requires only supportive measures at home. This would include feeding of food and plenty of fluids to drink. The commonest form of this category is upper respiratory infection or a common cold which is a self limiting and does not require any treatment.

The above strategy of management of mild, moderate and severe ARI has been found feasible in the community based studies.

ii) Vaccination against Common Childhood Disease

The whooping cough and measles are two important diseases which contribute significantly to deaths amongst under-fives. Diphtheria although uncommon also contribute to childhood mortality. Under the Universal Immunisation programme, Government of India, it is envisaged that 85% of infants would be covered with three does of DPT and one dose of measles vaccination. The immunisation coverage against these diseases would help in reduction of deaths due to them. The ARI is a common manifestation during measles, whooping cough and Diphtheria episodes.

iii) Health Education

Health education has been compared with a 'bottomless' pit but it is still the best approach for prevention of ARI.All channels of mass media should be used like TV, newspaper, Radio,

magazines to spread health education messages on following aspects:

i) ARI is an important cause of under-five deaths.

ii) Majority of ARI can be treated at community level.

iii) Children with cough and difficult breathing require treatment from a health worker immediately. Fast breathing and chest indrawing are signs of difficult breathing.

iv) A child with cough should be given adequate food and drinks.

v) A child with cough should be kept warm and not overwrapped.

vi) Immunisation against Diphtheria, whooping cough, and measles can prevent some serious kinds of Respiratory infections.

Health education of parents particularly mothers on above aspects would help in intiationsaction at the home level in treatment of ARI like in community management of diarrhoea.

The existing health care staff should be given inservice training in recognition of simple clinical manifestations which would help in community diagnosis and management of ARI. The training of health professionals should be decentralised as far as posible to achieve maximum success and coverage.

The Authors acknowledge the help given by Dr. Neelam Bhatia, Ms Tajinder Kaur, and Ms Rima Prothi in preparation of this paper.

ANNEXURES

Annexure - I

Participants

1. Dr Akhilesh Bhargava
   Asstt. Prof.
   Department of Preventive and
   Social Medicine
   SMS Medical College
   Jaipur

2. Dr A D Tiwari
   Reader
   Department of Paediatrics
   Medical College
   Rohtak

3. Dr A K Deorari
   Assistant Professor
   Department of Pediatrics
   AIIMS
   New Delhi

4. Dr A K Dutta
   Associate Professor
   Department of Paediatrics
   Kalawati Saran Hospital
   New Delhi

5. Dr A T Kannan
   Reader
   Deptt. of Preventive & Social Medicine
   University College of Medical Sciences
   New Delhi

6. Dr Bikash Roy
   Head
   Department of Pediatrics
   V.M. Hospital
   Agartala
   Krishnagar
   Tripura 799001

7. Dr G Anjaneyulu
   Prof. & Head
   Department of Social & Preventive Medicine
   Osmania Medical College
   Hyderabad

8. Dr Guiri Camotim
Chief Medical Officer
Department of Health Services
Panaji
Goa

9. Dr G S Chakravarty
Asstt. Commissioner(MCH)
Ministry of Health & Family Welfare
Nirman Bhavan
New Delhi

10. Dr Indrani Nagpaul
Regional Manager, PHC Unit
CARE - India
New Delhi

11. Dr J N Bhuyan
Prof. & Head
Department of Pediatrics
Guwahati Medical College
Guwahati

12. Dr J V Singh
Reader
Department of Social & Preventive Medicine
LLRM Medical College
Meerut

13. Dr J V Singh
Reader
K G Medical College
Lucknow

14. Dr (Ms) Kamlesh Chopra
Professor
Department of Peadiatrics
LNJP Hospital and Maulana Azad Medical College
New Delhi

15. Dr (Mrs) K Kathpalia
R-286 Greater Kailash - I
New Delhi

16. Dr L Taka, AO
Addl. Director
Directorate of Health & Family Welfare
Kohima

17. Dr M A Khan
Lecturer-cum-Epidemiologist
J N Medical College
Aligarh Muslim University
Aligarh

18. Dr Man Mohan
Pediatrician
Deptt. of Pediatrics
S J Hospital
New Delhi

19. Dr M V G Subrahamanayam
Prof. & Head
Department of Paediatrics
S V Medical College
Tirupati

20. Dr P Hartmann
Medical Officer
World Health Organisation
New Delhi

21. Dr P L Dhingra
Professor
Department of ENT
Maulana Azad Medical College
New Delhi

22. Dr (Ms) Prem Mehra
Associate Professor (Nursing Admn.)
National Institute of Health & Family Welfare
Munirka
New Delhi

23. Dr Raj Kumar
Asstt. Project Officer
UNICEF
73, Lodi Estate
New Delhi

24. Dr Ramesh Prasad
Prof. & Head
Department of Pediatrics
S N Medical College
Agra

25. Dr Shri Ram Singh Rana
Dy. C.M.O.
Tehri Garwal
New Tehri Town

26. Dr S J Atwood
Director
PHC Unit
CARE - India
New Delhi

27. Dr S K Mittal
Assoc. Professor
Department of Pediatrics
Maulana Azad Medical College
New Delhi

28. Dr (Ms) S Kumari
Deputy Director
Microbiology Division
National Institute of Communicable Diseases
22-Sham Nath Marg
Delhi

29. Dr Suresh Rana
ICDS Consultant
Department of Medicine
I.G. Medical College
Shimla

30. Dr S U Warerkar
Dean
Dr V N Medical College
Solapur

31. Dr Uma Chawla
Asstt. Director
Department of Epidemiology
National Institute of Communicable Disease
22, Sham Nath Marg
Delhi

32. Dr Umesh Kapil
Asstt. Professor
Human Nutrition Unit
AIIMS
New Delhi

33. Dr V Mohan
Professor & Head
Department of Community Medicine
Government Medical College
Amritsar

Resource Persons

1. Dr B N Tandon
   Prof. & Head
   Department of Gastroentrology
   and Human Nutrition
   AIIMS
   New Delhi

2. Dr A K Chakraborty
   Professor
   Department of Epidemiology
   All India Institute of Hygiene and
   Public Health
   110, Chittaranjan Avenue
   Calcutta

3. Dr Benu Mukerji
   Associate Professor
   Department of Paediatrics
   Govt. Medical College
   Jabalpur

4. Dr D M Saxena
   Prof. & Head
   Deptt. of Preventive & Social Medicine
   Govt. Medical College
   Surat

5. Dr K K Dutta
   Deputy Director
   Department of Epidemiology
   National Institute of Communicable Diseases
   22-Sham Nath Marg
   Delhi

6. Dr Lata Kumar
   Additional Professor
   Department of Pediatrics
   PGIMER
   Chandigarh

7. Dr N Shantharam
   Asstt. Professor
   Department of Social & Preventive Medicine
   Karnataka Medical College
   Hubli

8. Dr O P Ghai
Professor
Department of Pediatrics
Guru Teg Bahadur Hospital
Shahdra

9. Dr P L Joshi
Reader
Department of Social & Preventive Medicine
MLN Medical College
Allahabad

10. Dr R K Puri
Professor & Head
Department of Pediatrics
Maulana Azad Medical College
New Delhi

11. Dr Sunder Lal
Associate Professor & Head
Department of Preventive & Social Medicine
Medical College
Rohtak

12. Dr T Jacob John
Professor
Department of Virology and Immunology
Christian Medical College Hospital
Vellore

13. Dr T Rajagopal
Addl. Prof. of Pediatrics
Madurai Medical College and
Govt. Rajaji Hospital
Madurai

14. Dr V P Reddaiah
Addl. Professor
Centre for Community Medicine
AIIMS
New Delhi

Annexure - II

Programme Schedule

Tuesday, 29 August 1989

9.00 a.m. - 9.15 a.m. : Registration

9.15 a.m. - 10.15 a.m. : Inaugural Session

- Dr B N Tandon
  Prof. & Head
  Deptt. of Gastroenterology
  and Human Nutrition
  AIIMS
  New Delhi

10.15 a.m. - 10.30 a.m. : COFFEE

Chairperson: Dr K K Datta
Deputy Director
(Epidemiology)
NICD

10.30 a.m. - 11.20 a.m. : Services Available in ICDS areas and Strategies for Control of ARI in Children

- Dr R K Puri
  Prof. & Head (Paediatrics
  M.A.M.C.
  New Delhi

Discussion

11.20 a.m. - 12.10 p.m. : The Role of Immunization in the Control of ARI in Children

- Dr T Jacob John
  Prof. & Head (Virology & Immunology)
  CMC, Vellore

Discussion

12.10 p.m. - 1.00 p.m. : Management of ARI in Children

- Dr O P Ghai
  Prof. & Head (Paediatrics)
  G.T.B. Hospital, Shahdra

Discussion

1.00 p.m. - 2.00 p.m. : LUNCH

Chairperson: Dr R K Puri
Prof. & Head
M.A.M.C.

2.00 p.m. - 2.45 p.m. : Epidemiological Perspective on ARI in Underfives
- Dr V P Reddiah
Addl. Prof.
Centre for Community Medicine
AIIMS, New Delhi

Discussion

2.45 p.m. - 3.00 p.m. : Problems of ARI in India
- Dr K K Datta
Deputy Director
NICD, New Delhi

Discussion

3.00 p.m. - 3.15 p.m. : COFFEE

3.15 p.m. - 5.15 p.m. : Group Discussion on Role of Various Sectors in Prevention of ARI and Formulation of a ARI Control

Group I - Primary Prevention

Chairperson: Dr T Jacob John

Rapporteur: i) Dr Akhilesh Bhargava
ii) Dr A T Kanan

Group II - Secondary & Tertiary Prevention

Chairperson: Dr R K Puri

Rapporteurs: i) Dr Sunder Lal
ii) Dr A K Dutta

Wednesday, 30 August 1989

Presentation of Scientific Papers on ARI in Children

Chairperson: Dr S K Mittal
Assoc. Prof.
(Paediatrics)
M.A.M.C., New Delhi

9.00 a.m. - 9.15 a.m. : Prevention of ARI in Children in ICDS Projects

- Dr T Rajagopal
Addl. Prof. (Pediatrics)
Madurai Medical College

9.15 a.m. - 9.30 a.m. : Pilot Study of Control of ARI at Primary Care Level

- Dr N Shantharam
Asstt. Prof. (SPM)
Karnataka Medical College

Discussion

9.30 a.m. - 9.45 a.m. : Extent of Problem of ARI in Rural Area in ICDS Block and Preparing Manpower to Fight ARI

- Dr Sunder Lal
Assoc. Prof. & Head (P&SM)
Medical College, Rohtak

Discussion

9.45 a.m. - 10.00 a.m. : Some Epidemiological Features of ARI in West Bengal

- Dr A K Chakraborty
Prof. of Epidemiology
AIIHPH, Calcutta

10.00 a.m. - 10.15 a.m. : Rational Drug Therapy in ARI in Children

- Dr Lata Kumar
Addl. Professor (Paediatrics)
PGIMER, Chandigarh

10.15 a.m. - 10.30 a.m.	:	A Study of Morbidity and Mortality Amongst Preschool Children in 12 AWs of Surat Project - Dr D M Saxena Prof. & Head (P&SM) Govt. Medical College Surat Discussion
10.30 a.m. - 10.45 a.m.	:	Utilization of AWWs in Surveillance of ARI - Dr P L Joshi Reader (S & PM) MLN Medical College Allahabad
10.45 a.m. - 11.00 a.m.	:	Comparative Study of Mortality and Morbidity in 0-5 yrs. Children from ICDS (Urban Slum) and Non-ICDS (Rural) Projects - Dr Benu Mukerji Medical College Jabalpur Discussion
11.00 a.m. - 12.00 noon	:	COFFEE
12.00 noon - 1.00 p.m.	:	Presentation of Group Reports
1.00 p.m. - 2.30 p.m.	:	LUNCH
3.00 p.m. - 4.00 p.m.	:	Concluding Session Chairperson: Dr A K Chakraborty Prof. of Epidemiology AIIPH, Calcutta

Annexure-III

Kit Material

1. National Seminar on ARI in Children in ICDS project (29-30 August, 1989)

   - Background paper
   - Annotated Bibliography
   - Bibliography

   Prepared by Health Unit (NIPCCD).

2. Basic Principles for Control of ARI in Children in Developing Countries - A Joint WHO/UNICEF Statements
3. Supervisory Skills on 'Management of the Child with an Ear, Nose or Throat Infection

   - WHO, Programme of ARI

4. Training Module Management of the Child with Cough Exercise B

   - WHO, Programme of ARI

5. Supervisory Skills - Management of the Child with Cough

   - WHO, Programme of ARI

6. ARI News, Issue No. 6, December 1986
7. Dose Chart for Drugs of ARI Programme
8. The National Workshop for the ARI Control Programme held at Khajuraho, M.P. (3-6 September, 1987)

   - Directorate General of Health Services

9. NIPCCD Newsletter Vol. 9, No. 4, March - April 1989
10. NIPCCD - An Introduction

Annexure IV

Bibliography on ARI

- Dinesh Paul
Tejinder Kaur

Annotated Bibliography

1. Viral infections of the respiratory tract in hospitalised children

K.H. Carlsen, I Orstavik and K Halvorsen

Deptt. of Paediatrics and Microbiology laboratory, Ulleval Hospital and Deptt. of Paediatrics, Aker Hospital, Oslo, Norway.

Study conducted : not mentioned

Study published : 1983

Hospital- based data

Ulleval and Akera Hospitals, Oslo, Norway

Published : Acta Pediatr Scand, 1983; 72:53-58.

ABSTRACT

Objective To discern specific patterns of different viral infections of the respiratory tract in hospitalised children.

Methodology Virological examination of 70% (of the 3300) infants and children with acute respiratory infections, acute bronchial asthma or febrile convulsions was conducted. Epidemiological, clinical and laboratory data were collected retrospectively from hospital records. Wilcoxon-Mann Whitney rank test was used for statistical analysis.

Findings Respiratory viral infections were diagnosed in 979 children. Respiratory syncytial virus greatly out-numbered the other viruses: it caused 58% of the total virus infections and occurred in winter epidemics. Influenza A and B virus occurred during late winter and

---

* Deputy Director (Health), NIPCCD.

** Research Assistant (Health), NIPCCD.

spring, rhinovirus had a seasonal distribution towards spring and autumn, whereas adenovirus types 1,2, and 5 had no distinct seasonal distribution. Whereas, respiratory syncytial virus were mainly associated with bronchiolitis and adenovirus type 7 with pneumonia, rhinovirus infections were most often found in children with episodes of acute bronchial asthma. The influenza A and B and adenovirus types 1, 2, and 5 infections often occurred with extra-respiratory symptoms, especially febrile convulsions.

2. Child care practices in the management of ARIs

Kumar V, Kumar L, Mand M et al

PGIMER, Chandigarh

Study conducted : not mentioned

Study published : 1984

Published : Indian Pediatr 1984; 21:15-20

ABSTRACT

Objective — To study the knowledge of health workers and mothers regarding aetiology and treatment of respiratory infections.

Methodology — Interview technique was used for collection of information.

Findings — Most mothers and health workers:

- Prefer the modern system of medicine, but still mothers utilize services of RMPs in preference to qualified doctors.
- Can differentiate URI as being distinct from pneumonia
- Donot know pneumonia is caused by infectious agents
- Do not know that pneumonia can be completely treated in the village.

Recommendations — Reinforcement, Health education & dissemination of knowledge and training of RMPs.

3. Acute respiratory infections in Kangra district: Magnitude and current treatment practices

Jai P Narain and T D Sharma*

National Institute of Communicable Diseases, Delhi
and *District Health Department, Kangra Distt. Dharamsala, U.P.

Study conducted : October 1984 - Sptember 1985

Study published : 1987, Hospital based data

23 rural PHC 203 Subcentres and 6 hospitals

Published: Ind. J Paediatr 1987: 65: 441-444

ABSTRACT

Objective — To study the annual incidence of acute respiratory infections (ARI) and to test the WHO criteria for control of ARI under Indian conditions, as per the opinion of physicians practising at the peripheral level.

Methodology — A review of the medical records of PHCs in Kangra district for calculation of annual incidence rates for ARI considering the 1981 population census. Standard questionnarie was filled by a random sample of health centre physicians to elicit information on current treatment practices for ARI.

Findings — Of the 3,72,000 attendances at the PHCs, 18% were for ARI and 12% for diarrhoeal diseases. The annual incidence of visits for ARI among children below 5 yrs was higher than that of general population (8.2/1000 Vs 6.7/1000;. ARI was more common during the post monsoon period and among people living in mountaineous areas. The case fatality rate in hospitalised ARI patients was 10.5%. Interview of health centre physicians regarding ARI management practices indicated that chest indrawing (considered by WHO as pathognomonic of severe ARI) was not recognised as an important sign by majority of physicians. Ninety one percent of physicians disagreed (69% in strong terms) with the idea of providing health workers with antimicrobials for management of ARI at the community level

Recommendations

It is important to convince the physicians of the rationale behind and the need for providing the PHC workers with antibiotics, before launching a national control programme.

A uniform antibiotic policy needs to be formulated in the management of ARI throughout the country. Rapid development of diagnostic techniques for the etiologic diagnosis of severe ARI, which could be applied at the PHC level.

4. Socio-economic and ecologic corelates of acute respiratory infections in preschool children

B.N.S. Walia, S.K. Gambhir, S. Singhi and S.R. Sroa

Deptt. of Paediatrics, PGIMER, Chandigarh 160012

Study conducted : 1980-82

Study published : 1988

Rural area

Mundikharar, Distt. Ropar

Published: Indian Pediatrics, 1988; 25 : 607-612.

ABSTRACT

Objective — To prospectively study acute respiratory infections (ARI) morbidity in a rural child population and its environmental corelates.

Methodology — A total of 227 preschool children from a population of 3,264 were selected for the study. Data on health was collected by ANM during fortnightly home visits. About 108 of the cases reported by ANM were examined by the doctor.

Findings — There was no significant association between ARI attack rates and different socio-economic and environmental factors, viz, educational status of parents, per capita income, family size, type of housing condition, cooking fuel used, parental smoking and presence of domestic animals in the house.

5. Acute respiratory infections in children:

A hospital based report

A.K. Patwari, S. Aneja, R.N. Mandal and D.N. Mullick

Deptt. of Pediatrics, Lady Hardinge Medical College and Associated Kalawati Saran Children's Hospital, New Delhi-110001

Study conducted : not mentioned

Study published : 1988

Hospital - based data

Kalawati Saran Children's Hospital

Published: Indian Pediatrics, 1988; 25 : 613-617.

ABSTRACT

Objective — To study the morbidity and mortality in children suffering from ARI during a two year period.

Methodology — Clinical examination of ear, nose, throat and respiratory system was conducted for all children and X-ray chest was taken in all the cases and direct laryngoscopy performed in some cases wherever indicated. Diagnosis of pneumonia was radiologically confirmed.

Findings — ARI constituted 26.9% of hospital admissions. A total of 94% of all admissions due to ARI were below the age of five years. Pneumonia was the leading cause of hospitalisation in underfives admitted with ARI (83.9%) followed by bronchiolitis (5.0%) and post measles ARI was 22% of all hospital deaths and more than 78% of them were infants. Case fatality in children below five years of age was highest with post measles ARI (39.7%), pneumonia (18.9%) and acute laryngotracheobronchitis (14.4%). ARI contributed to large number of hospital deaths in underfives as compared to diarrhoeal.

6. Involuntary smoking and incidence of respiratory illness during first year of life

Pedreira FA, Guandolo VL, Feroli EJ et al, USA

Study conducted : not mentioned

Study published : 1985

Published: Pediatrics, 1985; 75 : 594-597

ABSTRACT

Objective — To study the association between involuntary smoking and incidence of respiratory illness during first year of life.

Methodology — Prospective cohort of 1144 children followed during first year of life to assess relative risk of ARI.

Findings — For bronchitis the relative risk was 1.44 and for tracheitis 1.9, when any one of the parent smoked.

7. Nutrition and acute respiratory infections

Eds. Dougias RM and Kerby Eaton E,

In. Acute Respiratory Infections

Proceeding of an International Workshop

Sydney, Aug. 1984 University of Adelaide,

Adelaide, 1985 : 68-71

ABSTRACT

Objective — To study morbidity and mortality due to ARI in malnourished children

Methodology — Prospective urban cohort of 492 of the 810 children admitted to hospital for ARI children below 5 years. PEM by weight for age.

Findings — ARI episodes were similar in normal or mild PEM (7.2) and moderate or severe PEM (7.2). Forty one percent had moderate-severe PEM v/s population prevalence of 21%. ARI case fatality rate: moderate to severe PEM 7.7% Mild PEM 2.3% and normal 0.7%. Relative risk of ARI death with moderate and severe PEM was 3.3.

8. Clinical profile of acute bronchiolitis

Devendra Sareen, Usha Sharma and S Saxena

Deptt. of Paediatrics, Jay Kay Lon MCHI, Jaipur

Study conducted : not mentioned

Study published : 1983

Hospital based data

Jay Kay Lon Mother & Child Health Institute, Jaipur

Published: Arch Child Hlth., 1983, 25(1), 1-8

ABSTRACT

Objective — To find out the clinical profile of acute bronchiolitis.

Methodology — A thorough clinical examination of 400 children with clinical diagnosis of acute bronchiolitis and recording of information on past and present morbidity and family history was done in order to institute appropriate treatment. Routine laboratory investigations were also conducted.

Findings — Acute bronchiolitis was most commonly observed in infants below 6 months of age. Congestive cardiac failure was found in 22% of these children and radiological evidences of emphysema was seen in most of them. Most of them improved within 10 days. Highest mortality was observed in infants below 6 month of age and those having associated congestive cardiac failure.

Recommendations — Cases of acute bronchiolitis should be investigated properly and managed accordingly to reduce mortality due to this viral disease in early infancy.

9. A comparative analysis of the treatment practices being followed in the management of acute respiratory infections (ARI) in children

Singh S, Kumar L and Kumar V

PGIMER, Chandigarh

Study conducted : 1984-85

Unpublished study

ABSTRACT

Objective — To compare the treatment practices being followed in the management of acute respiratory infections in children.

Methodology — Interview and observation techniques were used for collection of data.

Findings — Pediatricians provide better care than others. Institution - based doctors perform better than private practitioners. Need for continuing education and on-job-training programme. Gross misuse of antimicrobials in common cold. Inadequate duration of antimicrobial therapy in streptococcal sore throat. Incorrect choice of antimicrobials in pneumonia. Tetracyclines still being used in children.

Recommendations — More emphasis on current management practices in ARI.

10. Management of severely malnourished children by village workers in Integrated Child Development Services* in India.

Prof. B N Tandon et al

*Chairman ICDS Central Technical Committee for Health and Nutrition

Data analysed by Dr. Ajit Sahai, Biostatistics Division of ICDS Central Cell

Study conducted : not mentioned

Study published : 1984

Rural, tribal and urban area

Fifteen states of India

Published : J Trop Paediatr, 1984; 30:274-279

ABSTRACT

Objective — To evaluate the management of severely malnourished children by village workers in Integrated Child Development Services in India.

Methodology — A multistage stratified random sampling procedure was used for the selection of 6 anganwadis each from rural, tribal and urban slum strate of projects from 15 major states. The study was carried out at 406 anganwadis. Four thousand, two hundred and ninety two children with severe protein energy malnutrition were followed up every week for 6 to 12 weeks by 33 consultants.

Findings — Eighty five percent children improved, 6.3% had no change, 3.6% deteriorated, 3.0% died and 2.1% were lost to follow up. Diarrhoea, short fever and apparent respiratory illness were associated illnesses contribution to the death in 42.6%, 38.0% and 34.9% of fatal cases. Prevalence of severe malnutrition and fatality were higher in younger children less than 3 years of age compared tc older ones between 3 to 6 years of age. Referral

from village centre to larger health facilities was not utilised by majority of the relatives of the sick children. It is concluded that village level management of severely malnourished children by a local worker is an acceptable and effective approach and low cost.

Recommendation

The above mentioned approach is recommended for countries with endemic protein-calorie malnutrition.

11. Sequential health effect study in relation to air pollution in Bombay, India

Kamat, SR: Doshi, VB:

Published : Eur J Epidemiol. 1987: 3(3): 265-277

ABSTRACT

Objective — To study the effect of air pollution on health of the population.

Methodology — 4129 subjects from 3 urban (high, medium and low, according to SO_2 levels) and a rural community were studied for a period of four years. Morbidity was studied in relation to ecologic factors including levels of SO_2.

Findings — Initially in the three urban areas and the rural community, the standardized prevalences (in percent) were : for dysponea 7.3, 6, 3.2 and 5.5 for chronic cough and colds 18.0, 20.8, 12.1 and 11 percent. The diagnosis of chronic bronchitis was done in 4.5, 4.5, 2.3 an 5.0 percent and cardiac disorders 6.8, 4.3, 8.2 and 2.7 percent in respective 4 areas. After 3 years, 55-6[illegible]% of urban and 44% of rural subjects were reassessed. Several minor symptoms besides above ones were related closely to the urban air pollution profile. Yearly declines were larger in all urban areas as compared to rural area. The frequency of colds cough and dyspnoea was greater in urban area, especially in "urban medium" area. Monthly trends correlated to SO_2 levels and the daily fluctuations with SO_2 revealed a threshold between 50 to 100 ugs/cm/day. The major factors affecting morbidity were pollution, nutrition, occupation, smoking and age.

12. Recent respiratory and enteric adenovirus infection in children in the Manchester area

Richmond, SJ; Wood, DJ; Bailey, AS;

Published : J R Soc. Med. 1988: 81(1) : 15-18

ABSTRACT

Objective — To study the clinical and epidemiological aspects of a recent respiratory and enteric adenovirus infection in children.

Methodology — A community based study was conducted during a three year period to study the clinical and epidemiological aspects of respiratory and enteric adenovirus infection.

Findings — Seventy three group B adenoviruses (29 type 3 and 44 type 7) isolated. Considerable genetic heterogeneity was identified, particularly amongst the type 3 isolates, but this genome variation could not be correlated with either clinical or epidemiological findings. Group F adenoviruses were found in 132 (4.1%) of 3202 stool specimens from children with gastroenteritis and, after rotaviruses, they were the most common viruses identified. Unlike rotaviruses, these enteric adenoviruses were endemic throughout the 3 years study period and the greatest proportion of infections (47.6%) were found in babies under 6 months old.

12. Nosocomial infections in a pediatric intensive care unit

Milliken, J; Tait, GA, Ford Jones, EL: Mindorff, CM; Gold, R; Mullins, G;

Published : Crit Care Med, 1988; 16(3) : 233-237.

ABSTRACT

Objective — To study nosocomical infections in a Pediatric Intensive Care Unit (PICU).

Methodology — A total of 1388 patients in PICU were studied over a period of 30 months.

Findings — In all, 116 infections occurred in PICU. Lower respiratory tract infections comprised 15% of the infections. The remaining infections were divided equally among GI, skin, eyes, upper respiratory, postoperative wounds, and other sites. Coagulasenegative staphylococci, pseudomonas aeruginosa and staphylococcus aureus were the most prevalent pathogens. Surgical patients had similar rates of infection to medical patients. Patients in the first 2 years of life, particularly those between 7 and 30 days of age, had the highest rate of infection. Onset of infection was more common after the first week in the PICU with 11% of patients staying 14 to 20 days, 27% of patients staying 21 to 27 days, 48% of patients staying 28 to 34 days, and 52% of patients staying more than 35 days, before the onset of infection. The risk of nosocomial infection increases with arterial and central line use, prolonged intubation, ventilation, intracranial pressure monitoring and paralysis.

13. Respiratory syncytial virus epidemics : variable dominance of subgroups A and B Strains among children, 1981-1986

Mufron, MA; Belshe, RB; Orvell, C; Morrby, E;

Study Conducted : 1981-86

Study Published : 1988

Published: J Infect Dis, 1988; 157(1):143-148

ABSTRACT

Objective — To study the distribution of subgroups A and B strains from respiratory syncytial virus in Huntington, West Virginia.

Methodology — Two hundred and thirty five infants and children were studied for RSV.

Findings — RSV was isolated from 211 of the 235 infants and children. One hundred and sixty strains (75.8%) were identified as subgroup A and 51 (24.2%) as subgroup B. Subgroup A strains occurred at least three times as often in all years except 1984-85.

14. Evaluation of the health status of 0 to 4 year old children in an urban community of Abidjan

Diomande, I; Rey, JL; Imboua Bogui, G; Semenov, M;

Study conducted : 1985

Study published : 1988

Urban area

Abidjan, Ivory coast

Published: Med Trop Mars, 1988; 48(2): 111-115.

ABSTRACT

Objective To evaluate the health status of 0 to 4 year old children in Abidjan.

Methodology Four thousand households were randomly selected including 653 children under four years. Mothers were interviewed and children examined.

Findings Seventeen percent children were below the weight curve standardise for Ivory Coast, 8 percent had a ratio arm diameter on head diameter lower or level of 0.27 and 54% a ratio between 0.28 and 0.31. Diarrhoea was noted among 10% of children, bronchopneumopathy among 44.7%, rhinitis among 53.6% and otitis 15.4%. The interview of mothers confirmed these results; in addition appeared that 3% of children have had measles in the proceding month. The diarrhoeas or the ORI infections prevalence is linked with the lack of drinking water at home, the IRA prevalence with community habitat; ORL infections are more frequent among children from illiterate mothers.

Recommendation The situation can be improved by socio-economic progress and emphasizing measles immunization.

15. Longitudinal studies of infectious diseases and physical growth of infants in Huascar, an under-previleged periurban community in Lima, Peru.

Loper-de-Romana, G; Brown, KH; Black, RE;

Kanashiro, HC;

Study Conducted : 1982-1984

Study Published : 1989

Urban area

Lima, Peru

Published: Am J Epidemiol, 1989; 129(4):769-784.

ABSTRACT

Objective — To study infectious diseases and physical growth of infants in periurban community in Lima.

Methodology — A sample of 153 Peruvian newborns were studied longitudinally, during the first year of life The newborns included in the study were the ones with birth weight greater than 2500 g. Surveillance workers inquired about morbidity thrice a week during home visits besides takin anthropometric measurements.

Findings — During 48, 209 child days of observation, upper respiratory infections were present on 13, 409 child days (27.8% prevalence) and diarrhoea on 7,466 child days '15.5% prevalenc

The diarrhoea incidence rate averaged 9.8 episodes/child/year of observation; all children had at least one episode of diarrhoea Average weights approximated those of NCHS standards upto first 5-6 months and declined thereafter. Average lengths were less than the reference data at all ages. Rates of stunting and wasting increased progressively during the first year of life.

16. Viral etiology and epidemiology of acute respiratory infections in children in Nairobi, Kenya.

Hazlett, DT; Bell, TM; Tukei, PM; Ademba, GR;

Ochieng, WO; Magana, JM; Gathara, GW; Wafula, EM;

Pamba, A; Ndinya Achola, JO; et al

Published : Am J Trop Med Hyg, 1988; 39(6): 632-640

ABSTRACT

Objective — To study viral etiology and epidemiology of acute respiratory infections in children in Nairobi.

Methodology — Clinical and microbiological studies were conducted on 822 children under five years of age.

Findings — Viruses were demonstrated in 54% of the 822 children studied, but over half of the viruses identified were types not commonly associated elsewhere with the causation of severe ARI. Respiratory syncytial, parainfluenza, and adenoviruses occurred in the same age groups and during similar weather conditions as elsewhere. Herpes simplex, rhino, and enteroviruses play causative roles in some cases of severe ARI in Kenyan children.

17. Assessment of clinical criteria for identification of severe acute lower respiratory tract infections in children

Campbell, H; Byass, P; Lamont, AC; Forgie, IM;

O'Neill, KP; Lloyd Evans, N; Greenwood, BM;

Published : Lancet, 1989; 1(8633):297-299.

ABSTRACT

Objective — To assess clinical criteria for identification of severe acute lower respiratory tract infections (LRI) in children

Methodology — A cohort of 500 Gambian children under 4 years of age was studied. Clinical and radiological examination was conducted.

Findings — Symptoms and signs at presentation were related to radiological evidence of lobar consolidation, indicating severe LRI. In infants, a fever greater than 38.5 degree C, refusal to breast feed, or the presence of vomiting were the best predictors of severe LRI. In children aged 1 to 4 years, a fever of greater than 38.5 degree C or a respiratory rate greater than 60/min were the most accurate clinical signs for severe LRI. Chest indrawing did not discriminate severe LRI.

18. Analysis of respiratory syncytial virus diseases in hospitalized children in the district of steyr 1984-85

Emhofer, J; Ploier, R; Popow Kraupp, T;

Brunhuber, W;

Study Conducted : 1984-85

Study Published : 1988

Published : Pediatr Padol, 1988; 23(1): 15-23

ABSTRACT

Objective — To study the pattern of respiratory syncytial virus (RSV) diseases in hospitalized children in Steyr.

Methodology — Nasopharyngeal secretions of hospitalized infants with diseases of the lower respiratory tract were examined for viral antigens.

Findings — RSV antigen could be detected in 34 of the 71 secretions. In these infants a serious clinical course, pneumonia, bronchiolitis or obstructive bronchitis was dominant, but laboratory tests showed no charecteristic pattern. Pulmonary X-rays of the RSV-infected infants revealed interstitial pneumonia with or without pulmonary infiltration, in addition to symptoms of hyper inflation.

19. Respiratory syncytial virus

Sinnott, JT; Gilchrist, LS; Ellis, L;

Published : Pediatrics, 1989; 83(3):380-384

ABSTRACT

Respiratory syncytial virus (RSV) is considered to be a significant pathogen causing bronchiolitis and pneumonia through close contact. Infants suffering from congenital heart disease or bronchopulmonary dysplasia are more succeptible. Available diagnostic studies include viral isolation, fluorescent antibody stains and enzyme immunoassays. Aerosolized ribavirin therapy is beneficial. Strict environmental control and use of protective clothing and eyewear help to reduce nosocomial spread of RSV.

20. Morbidity pattern in children below three years attending a rural health centre in Haryana.

Umesh Kapil and A.K. Sood

Human Nutrition Unit, AIIMS, New Delhi-110029

Deptt. of Preventive and Social Medicine,
Medical College, Rohtak

Study Conducted : not mentioned

Study Published : 1989

Rural area

Faridabad

Published : Ind Pediatrics, 1989; 26: 550-552

ABSTRACT

Objective — To study the morbidity pattern in children below three years attending a rural health centre in Haryana.

Methodology — All the children coming to the rural health centre were prospectively studied.

Findings — The common morbidity conditions found were Pyoderma (23.65%), respiratory infection (21.18%), diarrhoea (20.05%), ear infection (6.58%) and eye infection (5.46%). The maximum episodes of morbidity were recorded in summer season (39.22%) followed by rainy (31.36%) and winter season (30.16%).

Recommendations — Medicines may be supplied according to seasonal pattern of diseases.

21. Group A streptococcus - associated upper respiratory tract infections in a day-care centre.

Smith, TD; Wilkinson, V; Kaplan, EL;

Published : Pediatrics, 1989; 83(3) : 380-384

ABSTRACT

Objective — To study group A streptococcus - associated upper respiratory tract infections in a day care centre.

Methodology — Microbiologic and antigenic studies were conducted in a day care centre. Both, the children and the adult inmates were studied.

Findings — During an initial three month period, symptomatic upper respiratory tract infections associated with throat cultures or rapid antigen detection tests positive for group A streptococci developed in 55 of 214 (26%) children and adult staff in the centre. Fifty two of the 146 (36%) children and 2 of the 24 (8%) adult staff, who were off antibiotics, had throat cultures positive for group A streptococci. Of the 54 group A streptococcal isolates found, M2, T2/28 (35%), M3, T3/13(30%), and M-NT, T25 (20%). The overall group A streptococcal positivity rate was 49% for 187 children and 33% for 27 adult staff; 18 of 66 (27%) children younger than 3½ years of age were found to have group A streptococci in their upper respiratory tract

22. Acute respiratory infections in rural undervices

V.P. Reddiah and S.K. Kapoor

Centre for Community Medicine, AIIMS, New Delhi-110029

Study Conducted : 1986

Study Published : 1988

Rural area

Ballabgarh block

Published : Indian J Pediatr, 1988; 55: 424-426

ABSTRACT

Objectives — To find cut the morbidity and mortality due to ARI, and their seasonal variation.

Methodology — All (5, 078) the underfives of 25 villages of Ballabgarh block were prospectively studied. A monthly follow-up was conducted by trained field assistants to record the episodes of ARI occurring in preceding two weeks and recording births and deaths. Attack rates were calculated.

Findings — The morbidity due to ARI was 3.67 attacks/chil'/ year with lowest attack rates in summer (2.1 in June) and highest in winter (4.78 in January). The moderate and severe cases constituted 14.7% of all cases. Proportional mortality rate due to ARI was 22.6% inthese children. 66.5% of deaths were in infants. But the case fatality was 1.31% and the ARI related mortality was 6.3/1000 children and underfive mortality was 26/1000 children.

23. Acute respiratory infections of children

A new priority for Community Health Programmes

M.C. Steinhoff
Assistant Professor
Department of Epidemiology and Pediatrics, University of Michigan, Ann Arbor, Michigan, USA

Study Conducted : not mentioned

Study Published : 1986

Data from WHO and SRS (Sample Registration Scheme), Govt. of India

Published : Ind J Comm. Med., 1986; XI(1):1-9

ABSTRACT

Objective — To review data on Acute Respiratory Infections (ARI) among children in India and compare it with data from N. America.

Methodology — A comparative analysis of data from WHO and SRS, Govt. of India, was conducted.

Findings — Children in both India and North America experienced 5 to 8 episodes of respiratory tract infection/year. ARI mortality was nearly all due to deaths from pneumonia. ARI mortality rates in developing countries are upto 100 times higher than ARI rates currently seen in N. America orN. Europe. SRS surveys for childhood mortality showed that ARIs account for 20 to 30 per cent of deaths of children under five in Ind The symptoms reported in cases of ARI are attributed to infections due to a number of organisms.

24. A longitudinal study of morbidity among under-five children in a semi-urban area

S. Venkatesh* and R.D. Bansal**

*Deptt. of Preventive and Social Medicine, University College of Medical Science, New Delhi-110029

**Deptt. of Preventive and Social Medicine, Lady Hardinge Medical College, New Delhi-110001

Study Conducted : 1982

Study Published : 1986

Urban area

Kuruchikuppam municipal wards, Pondicherry

Published : Indian J of Comm. Med, 1986; XI(1):11-20

ABSTRACT

Objective — To determine the incidence and prevalence of morbidity; to identify the leading causes of morbidity; and to study the effects, if any, of seasonal variations on the morbidity pattern

Methodology — A longitudinal study was conducted on 224 children under five years of age. The children were clinically examined and their mothers were interviewed for medical history of the children.

Findings — A child had 4.85 episodes of illness annually on an average. Incidence rate for illness episodes and children affected was highest during the second quarter of the year, i.e., April to June. Upper respiratory tract infections showed the highest recurrence (3.95) followed by diarrhoea (3.49). Respiratory illness and diarrhoea accounted for 64.9% of all morbidity.

Bibliography

1. Acute respiratory infections in under-fives; 15 million deaths a year (editorial)
Lancet, 1985;2(8457):699-701.

2. Agre, F;
The relationship of mode of infant feeding and location of care to frequency of infection
Am J Dis Child, 1985; 139(8): 809-811

3. Anestad, G;
Surveillance of respiratory viral infections by rapid immunofluorescence diagnosis, with emphasis on virus interference.
Epidemiol infect, 1987; 99(2): 523-531

4. Artemov, VG; Zamotin, BA; Lysov, IV;
Infectious morbidity in children of both sexes during the first 7 years of life.
Zh Mikrobiol Epidemiol Immunobiol, 1986; (7): 71-75

5. Benguigui, Y;
Control of acute respiratory infections in children in Para, Brazil.
Bol of Sanit Panam, 1987; 102(1):36-48

6. Berrman, S; Mc Intosh, K;
Selective primary health care; strategies for control of disease in the developing world. XXI. Acute respiratory infections
Rev Infect Dis, 1985; 7(5): 674-691

7. Birchfield, ME;
Illnesses and children in a preschool centre
Matern Child Nurs J, 1986; 15(3): 187-197

8. Bjerregaard, P;
Infectious diseases in Greenlanders of Upernavik
Scand J Prim Health Care, 1985; 3(3): 163-169

9. Brown, RB; Stechenberg, B; Sands, M;
Hosmer, D; Ryczak, M;
Infections in a pediatric intensive care unit
Am J Dis Child, 1987; 141(3): 267-270

10. Bulla, A;

The exceedingly high burden of acute and chronic respiratory diseases-global situation and prospects
Z Erkr Akmungsargane, 1986; 167(1-2): 63-67

11. Bulla, A; Hitze, K.L.;

Acute respiratory infections: a review.
Bulletin of the World Health Organisation, 1978; 56(3): 481-498

12. Campbell, H; Byass, P; Lamont, AC; Forgie, IM;

O' Neill, KP; Lloyd Evans, N; Greenwood, BM;
Assessment of clinical criteria for identification of severe acute lower respiratory tract infections in children
Lancet, 1989; 1(8633): 297-299

13. Carlsen et al;

Viral infections of the respiratory tract in hospitalised children
Acta Pediatr Scand, 1983; 72:53-58

14. Chretien, J; Holland, W; Macklem, P;

Murray, J; Woolcock, A;
Acute respiratory infections in children
A global public health problem.
New England J Med, 1984; 310(15): 982-984

15. Connally, JH; Russell, JD; Robinson, FL; Canevan, DA;
Echovirus type 7 outbreak in Northern Ireland during 1984
Ulster Med J, 1985; 54(2): 191-195

16. Damodaran, M; Nadamuni Naidu A;

Rameswar Sarma KV;
Anemia and morbidity in rural pre-school children
Ind Jour Med Res, 1979; 69:448

17. Datta, N;

ARI in LBW infants
J of Pediatr, 1987; 54: 171-176

18. Datta, N; Kumar, V; etal.

Case management in the control of acute respiratory infections in low birth weight infants: a feasibility study.
Bull Wld Hlth Org, 1987 (in press).

19. Denny, FW;

Acute respiratory infections in children: etiology and epidemiology
Pediatr Rev, 1987; 9(5): 135-146

20. Denny, FW; Clyde, WA Jr;

Acute lower respiratory tract infections in nonhospitalised children
J Pediatr, 1986; 108 (5 Pt 1): 635-646

21. Denny, FW; Collier, AM; Henderson, FW;
Acute respiratory infections in day care.
Rev. Infect Dis, 1986; 8(4): 527-532

22. Denny, FW; Loda, FA;
Acute respiratory infections are the leading cause of death in children in developing countries
AM J Trop Med. Hyg, 1986; 35(1): 1-2

23. Doraisingham, S; Goh, KT; Ling, AE;
Epidemiology of viral infections in Singapore
Ann Acad Med Singapore, 1987; 16(2): 243-249

24. Doraisingham, S; Ling, AE;

Patterns of viral respiratory tract infections in Singapore
Ann Acad Med Singapore, 1986; 15(1): 9-14

25. Douglas, RM;

Acute respiratory infections.
Regional Office for the Western Pacific
1979 (Document WHO/WPR/RC 30/TP/1)

26. Edwards, KM; Thompson, J; Paolini, J;
Wright, PF;
Adenovirus infections in young children
Pediatrics, 1985; 76(3): 420-424

27. Fleming, DW; Cochi, SL; Hightower, AW;
Broome, CV;

Childhood upper respiratory tract infections; to what degree is incidence affected by day-care attendance?
Pediatrics, 1987; 79(1): 55-60

28. Ford, GW; Rickards, AL; Kitchen, WH;

Lieschke, JV; Keith, CG; Kynn, MM;
Handicaps and health problems in 2 year old children of birth weight 500 to 1500 g.
Aust Pediatr J. 1985; 21(1): 15-21

29. Fosarelli, PD; De Angelis, C; Winkelstein, J; Mellits, ED;

Infections illness in the first two years of life
Pediatr Infect Dis, 1985; 4(2): 153-159

30. Fox, JP; Cooney, MK; Hall, CE; Foy, MM;
Rhinoviruses in Seattle families, 1975-1979
Am J Epidemiol, 1985; 122(5): 830-846

31. Friedric, W; Ende, W;
Incidence and significance of disease of the paranasal sinuses in small children
Z Arztl Fortbild Jena, 1986; 80(17): 707-710

32. Geller Bernstein, G; Kenett, R; Weisglass, L; Tsur, S; Lahav, M; Levin, S;

Atopic babies with wheezy bronchitis. Followup study relating prognosis to sequential IGE values, type of early infant feeding, exposure to parental smoking and incidence of lower respiratory tract infections,
Allergy, 1979; 42(2): 85-91

33. Giugliani, ER; Seffrin, CF; Goldan, M; Horn, JF, Ebrahim, GJ;

The malnourished children of the urban squatter families: a study in Porto Alegre, Brazil
3 Trop Pediatr, 1987; 33(4): 194-198

34. Gray, BM; Dillon, HC Jr;

Clinical and epidemiologic studies of pheumococcal infection in children
Pediatr Infect Dis, 1986; 5(2): 201-297

35. Gupta, KB; Walia, BNS;

A longitudinal study of morbidity in children in a rural area of Punjab.
Ind Jour Pediatr, 1980; 47(387):297

36. Hazlett, DT; Bell; TM; Tukei, PM; Ademba, GR;

Ochieng, WO; Magana, JM; Gathara, GM; Wafula, EM; Pamba, A; Mdinya Achola, JO, etal;
Viral etiology and epidemiology of acute respiratory infections in children in Nairobi, Kenya
Am J Trop Med Hyg, 1988; 39(6): 632-640

37. Heinz, F; Tumova, B; Januska, J, Kramar, R; Vala, V;
Effectiveness of virologic surveillance of acute respiratory diseases of viral orgin
Cesk Epidemiol Mikrobiol Imunol, 1987;
36(3): 132-139

38. Indira Bai, K;
Morbidity pattern in children under five years in a rural community
Arch Chld Hlth, 1973; 15(2): 83

39. Ismail, R; Djamil, H; Anwar, Z; Pardede N; Arfin, F;
Acute respiratory tract infection prevalence, mortality and case management in the community in eleven villages of rural South Sumatra, Indonesia
Pediatr Indones, 1987; 27(3-4): 61-67

40. Kalra, A; Pandey, DN; Dayal, RS;
A decade of morbidity and mortality pattern amongst children hospitalised in a pediatrics (Medical) unit Agra.
Ind Pediatr, 1980; 27: 893

41. Kamat, SR; Doshi, VB;
Sequential health effect study in relation to air pollution in Bombay, India
Eur J Epidemiol, 1987; 3(3): 265-277

42. Kapil, U; Sood, AK;
Morbidity pattern in children below three years attending a rural health centre in Haryana
Ind Pediatr, 1989; 26: 550-552

43. Kenoall, EJ;
Acute respiratory infections in the population
JR SOC Med, 1985; 78(4): 282-290

44. Khatua, SP;
Acute Bronchiolitis (A study of 205 cases)
Ind Pediatr, 1977; XIV (4): 285

45. Klein, JO;
Emerging perspectives in management and prevention of infections of the respiratory tract in infants and children
Br J Hsp, 1985, 78(38): 38-41

46. Kohno, C; Ohtahara, S;

Cause of death in severely handicapped children
No To Hattatsu, 1986; 18(5): 420-422

47. Kumar, L;

Severe lower respiratory tract infection; etiology and management
Indian J Pediatr, 1987: 54: 189-198

48. Kumar, L, Singh RP;

Staphylococcal lung disease in Indian children (Abstract). Symposium on Acute Respiratory Infection in Asian Children. Sixth Asian Congress of Pediatrics, P 51

49. Kumar, V;

Need for a national control programme for acute respiratory infections.
Indian J Pediatr, 1987; 54(2): 145-148

50. Kumar, V; Datta, N; Kumar, L;

Experience in the implementation of ARI control activities as a part of primary health care. Technical Advisory Group on Acute Respiratory Infections, Second Meeting, Geneva, March-25-29, 1985
Document WHO/TRI/ARI. TAG. 11/85 14

51. Kumar, V; Kumar, L; Mand, M;

Child care practices in the management of ARIs
Ind Pediatr, 1984; 21:15-20

52. Kumari, S; Gupta, R; Bhargava, SK;

A nursery outbreak with salmonella Newport.
Ind Pediatr, 1980; XVIII (1): 11

53. Lang, T; Lafaix, C; Fassin, D; Arnaut, I;

Salmon, B; Baudon, D; Ezekiel, J;
Acute respiratory infections: a longitudinal study of 151 children in Burkina-Faso
Int J Epidemiol, 1986; 15(4): 553-560

54. Leowski, J;

Mortality from acute respiratory infections in children under 5 years of age: global estimates Wld Hlth Stat Quart. Rapport Trimestrial De Statistiques Sanitaires Mondiales, 1986; 39 (2): 138-144.

55. Limpitikul, W; Thisyakorn, U;

Lower respiratory tract infection due to Mycoplasma pneumoniae in Thai Children J Med Assoc Thai, 1987; 70(6): 335-337.

56. Lokeshwar, SM; Pai, PM;

Mortality in children - An analysis of 1690 deaths Ind Pediatr, 1980; XVII(2): 145.

57. Lopez-de-Romana, G; Brown, KH; Black, R.E; Kanashiro, HC; Longitudinal studies of infections diseases and physical growth of infants in Huascar, an underprivileged periruban community in Lima, Peru. Am J Epidemiol, 1989; 129(4): 769-784.

58. Luwang, NC; Singh, SB; Devi, N; Morbidity pattern amongst pre-school children of a hill tribal community of Manipur, Ind Jour of Prev Soc Med, 1989; XV(4): 169.

59. Moderova, E; Kestnerova, V; Cervenka J; Pucekova, C; Prevalence of nosocomial infections in Selected hospitals J Hyg Epidemiol Microbiol Immunol, 1987; 31(4): 365-374.

60. Menzel, K Medical Care for infants in the maternal health service - significance for reducing postneonatal mortality Z Gesamte Hyg, 1987; 33(2): 83-84.

61. Menzel K; Frey, J; Hotze, W; Borner, B; Uniform care of children upto 3 years of age at child day care centres in the city of Erfurt. Z Gesamte Hyg, 1987; 33(2): 75-77.

62. Milliken, J; Tait, GA; Ford-Jones, EL; Mindorff, CM; Gold, R; Mullins, G; Nosocomial infections in a pediatric intensive care unit
Crit Care Med, 1988; 16(3): 233-237.

63. Mohs, E;
Acute respiratory infections in children; possible control measures.
Bull Pan Am Health Organ,
1985; 19(1): 82-87.

64. Mtango, FDE; Neuvian, D;
Acute respiratory infections in children under five years. Control project in Bagamoyo District, Tanzania.
Trans Roy Soc Med Hyg, 1986; 80: 851-858.

65. Narain, JP;
Epidemiology of acute respiratory infections
Indian J Pediatr, 1987; 54(2): 153-160.

66. Narain, JP; Sharma, TD;
ARI inKangra District
Ind J Pediatr, 1987; 65: 441-444.

67. Narain, JP; Sharma, TD;
Acute respiratory infections in Kangara district: magnitude and current treatment practices
Indian J Pediatr, 1987; 54(3): 441-444.

68. Narain, JP; Sharma, RS; Sehgal, PN;
Control of acute respiratory infections in children.
J Commun Dis, 1987; 19(2): 136-140

69. Pacini, DL; Collier, AM; Henderson, FW;
Adenovirus infections and respiratory illness in children in group day care.
J infect Dis, 1987; 156 (6): 920-927.

70. Partatmo, A; Soenarto, Y; Triatmodja; Ismangoen H; Haksohusodo, S; Slemon, RD;
Mild acute upper respiratory infection (AURI) in children from the Outpatient Paediatric Department, Dr. Sardjito General Hospital Yogyakarta
Pediatr Indones, 1987; 27(1-2): 20-28.

71. Patwari, AK; etal.
Acute respiratory infections in children
Ind Pediatr, 1988; 25: 613-617.

72. Pedreira, FA; et al
Involuntary smoking and incidence of respiratory illness during first year of life
Pediatrics, 1985; 75: 594-597.

73. Pickering; LK;
Infections in day care.
Pediatr Infect Dis J, 1987; 6(6): 614-617.

74. Pio, A;
WHO Programme on Acute Respiratory Infections.
Ind J Pediatr, 1988; 55: 197-205.

75. Pio, A;
Acute respiratory infections in children of developing countries : an international point of view
Pediatr Infect Dis, 1986; 5: 179-183.

76. Pio, A; et al
The magnitude of the problem of acute respiratory infections.
In: Douglas, RM; & Kerby - Eaton E(eds), Acute respiratory infections in childhood. Proc. of an international workshop, Sydney, August 1984. Adelaide, University of Adelaide, 1985.

77. Prasad Rao, DCV; Puri, RK;
Morbidity pattern seen in urban pediatric Centre
Ind J Pediatr, 1973; 40:396.

78. Proceedings of the International workshop, Sydney, Nutrition and Acute Respiratory Infections.

79. Ravasarinoro, M; Razafimihery, J; Razacamparany, M; Coulanges, P;
Viral etiology of acute respiratory infections in Madagascan children
Arch Inst Pasteur Madagascar, 1986; 52(i) : 147-155.

80. Recommendations for using Pneumococcal vaccine in children.
American Academy of Pediatrics, Committee on Infectious Diseases, 1984-85
Pediatrics, 1985; 75: 1153-1158.

81. Reddiah, VP; Kappor, SK;
Acute respiratory infections in rural underfives
Ind J Pediatr, 1988; 55: 424-426.

82. Reeves, WC; Dillman, L; Quiroz, E; Loo, S; Lugue, S; Harris, S; Brenes, MM; de la Quardia, ME; Centeno, R: Sanchez, V; et al
Epidemiology of acute respiratory disease at the Peadiatric emergency room of the social security medical centre in Panama city, Panama.
Bull Pan Am Health Organ
1985; 19(3): 221-234.

83. Respiratory syncytial virus surveillance in various regions across Canada.
Can Med Assoc J, 1987; 15; 136(2): 157-158.

84. Richmond, SJ; Wood DJ; Bailey, AS;
Recent respiratory and enteric adenovirus infection in children in the Manchester area
J R Soc Med, 1988, 81(1): 15-18.

85. Ruley, ID; Lehmann, D; Alpers, MP; etal
Pneumococcal vaccine prevents death from acute lower respiratory tract infections in Papula New Guinean children
Lancet, 1986; 2: 877-881.

86. River on Corteguera, R; Rojo Concepcion, M; Gonzalez Valdes, JA;
Mortality due to acute respiratory diseases in children younger than 5 year old Cuba, 1968-1984.
Sante Publique Bucur, 1987; 30(3): 197-206.

87. Santhakrishan, BR; Peter A; Ragu, BV;
Morbidity and Mortality pattern of children in Madras city.
Ind J Pediatr, 1973; 40(310): 389.

88. Sareen Devendra; etal
Clinical profile of acute bronchiolitis,
Arth Child Hlth, 1983; 25(1) : 1-8.

89. Schopfer, K; Germann, D; Eggenberger, K;
Bachler, A; Wunderli, W;
Viral respiratory infections in children:
new diagnostic methods for early detection
Initial results of a pilot project in
Switzerland.
Schweiz Med Wochenschr, 1986, 116(16): 502-507

90. Shann, F;
Etiology of severe pneumonia in children
in developing countries
Pediatr Infect Dis, 1986; 5: 247-252.

91. Singh, S; Kumar, L; Kumar, V;
A comparative analysis of the treatment
practices being followed in the management
of ARI in children.
Unpublished study.

92. Sinha, B; Banerji, SC; Singh, G;
A prospective study of morbidity and
mortality among infants in Allahabad City.
Ind Med Gaz, 1979; CXIII(3); 83.

93. Sinnott, JT 4th; Gilchrist, LS; Ellis, L;
Respiratory syncytial virus
Infect - control - Hosp - Epidemiol. 1988;
9(10) : 465 - 468.

94. Smith TD; Wilkinson V; Kaplan El;
Group A streptococcus - associated
upper respiratory tract infections in
a day - care centre.
Pediatrics, 1989; 83(3): 380-384.

95. Stansfield, SM;
Acute respiratory infections in the developing
world: Strategies for prevention, treatment
and control.
Pediatr Infect Dis J, 1987; 6:622-629.

96. Steinhoff, MC;
Acute respiratory infections of children,
A new priority for community health programmes
Ind J Comm Med, 1986; XI(1):1-9

97. Tandon, BN; etal
Management of severely malnourished children by village workers in ICDS in India
J Trop Pediatr, 1984; 30:274-279.

98. Thomas, S; Verma, IC; Singh, M; Bhujwala RA;
Study of neonatal listeriasis in North India
Ind J. Med Res, 1981; 74:28.

99. Udani PM;
Acute infections of the lower respiratory tract The situation in developing countries and those with poor resources.
Bull Int Union Tuberc., 1985; 60(1-2):62-67.

100. Venkatesh, S; Bansal, RD;
A longitudinal study of morbidity among under-five children in a semi-urban area.
Ind J Comm Med, 1986; XI(1): 11-20.

101. Wafula, EM; Tukei, PM; Bell, TM; Nzanze, H; Ndinya Achola JO; Hazlett, DT; Ademba, GR; Pamba, A;
Diagnosis of acute respiratory infections (ARI) among under fives in the paediatric observation ward (POW), Kenyatta National Hospital Nairobi.
East Afr Med J, 1987; 64(4): 263-269.

102. Walia, BNS, etal
Socio-economic and ecologic correlates of ARIs in preschoolers
Ind Pediatr, 1988; 25: 607-612.

103. Winter, GF; Inglis, JM;
Respirtory viruses in children admitted to hospital in Edinburgh 1972-1985.
J Infect, 1987; 15(1): 103-107.

104. World Health Organisation
Case management of acute respiratory infections in children in developing countries
Document WHO/RSD/85.5, Rev 2.

105. World Health Organisation
Respiratory Infections in children at small hospital : Background notes and a manual for doctors
Document WHO/RSD/86.26.

106. World Health Organisation
Agute respiratory infections: A guide for the Planning, Implementation and Evaluation of Control Programmes within Primary Health Care.
Document WHO/RSD/86.29.

107. World Health Organisation Regional Office for South-East Asia
Acute respiratory infections in South-East Asia: Report of an inter-country meeting.
New Delhi, 8-11 October, 1986.
WHO, SEARO Technical Publication no. 8, 1986.

108. WHO/UNICEF, Joint Statement on basic principles for control of acute respiratory infections in children in developing countries
WHO/UNICEF, Geneva, 1986.

109. Zhang, ZL; Gao, LM; Wang; ZL; Cao, YP; WU, GC; Zhu, ZH;
Acute respiratory infections in Beijing children. Epidemiological studies at Dongguan Brigade
Chin Med J Engl, 1986; 99(7): 561-568.

110. Zheleznova, TG; Rashchinskii, MI; Novozhilov, PS;
Clinico-etiologic characteristics of severe and complicated forms of acute respiratory virus infections and their respiratory virus infections and their treatment
Tr Inst Pastera, 1985; 63:31-34.

NIPCCD PUBLICATIONS

			(Price) (Rs.)
	AVAILABLE AT 40% DISCOUNT TO ALL		
1.	Famine Relief in Bihar		15.00
2.	People Can Avert Famine		3.00
3.	Famine Relief and Reconstruction		10.00
4.	People's Role in Social Defence		10.00
5.	School in the Community		10.00
6.	All India Directory of Welfare Agencies for the Blind		8.00
7.	Working Mother and Early Childhood Education		25.00
8.	Some Facets of Child Development		30 00
9.	Working Children in Bombay		50.00
10.	Creches in Plantation	(Paper Back)	16.00
		(Lib. Edn.)	34.00
11.	Social Profile of Children in Arid Zone of Rajasthan	(Paper Back)	40.00
		(Lib. Edn.)	70.00
	AVAILABLE AT 40% DISCOUNT TO BOOKSELLERS & 25% TO LIBRARIES, RESEARCH AND ACADEMIC INSTITUTIONS/VOLUNTARY AGENCIES.		
12.	Rehibilitation of Blind		15.00
13.	Panchayati Raj Institutions in West Bengal		18 00
14.	Studies in Child Care		65.00
15.	Project Management		38 00
	AVAILABLE AT NORMAL PRICE		
16.	Voluntary Action in India—Some Profiles		19.00
17.	All India Directory of Voluntary Agencies in Rural Development (Vol. II)		27.00

NOTE : Sl. No. 12 is available at 25% discount only.

Copies can be had from :

Publication Officer
National Institute of Public Cooperation
and Child Development
5, Siri Institutional Area
Hauz Khas
New Delhi-110016

Printed by Publication Officer at Reprography Unit, National Institute of Public Cooperation and Child Development, 5, Siri Institutional Area, Hauz Khas, New Delhi-110016. Cover Bound by Narain Book Binder & Printers, 251-A, Munirka, New Delhi-110067.